

## Aurora and Hope



[Opening theme music.]

### **Joel McKinnon**

Welcome back, friends, to another episode of Seldon Crisis. This one is going to be a solo piece, because that last one with Kim Stanley Robinson was just too special to do anything else, and I've got quite a few thoughts to share about it. There may be no greater pleasure than the experience of spending a couple of hours hanging out with your favorite science fiction writer. I'll be buzzing from that one for a long time.

### **Joel**

I'm going to try to do a few things in the essay/recap, and have a special treat planned for the middle of it, but first I have to give a big spoiler warning. One of the reasons I'm such a huge fan of Asimov is the wonderful twists in his writing and I take great care not to spoil those twists for anyone who hasn't read his work. KSR doesn't typically have as many plot twists, though there are a few big ones here and there. This is more about just not wanting to spoil the pleasure of reading a great novel by having it deconstructed for you in advance. One such novel is Robinson's 2015 interstellar travel epic Aurora. I talked with him about it a fair amount in the last episode and after we signed off, I asked a special favor – if he would mind if I read a brief excerpt on the next podcast and he granted his permission. Before I get to that, though, I have to fill you in on the general context of the novel and where the excerpt appears.

The story begins with a starship bound from Earth to one of our nearby neighbors, Tau Ceti, a star similar to our Sun but just a little smaller, and home to several “super Earths,” that is, large rocky planets with significantly higher surface gravity than our own, but with likely moons that might be good candidates for habitability. The starship holds more than 2,000 travelers and numerous plants and animals, arranged in multiple biomes designed to mimic the various corresponding locales on Earth. There’s a tundra biome, a savannah biome, a tropical one, several more temperate ones. The ship has been traveling for over 200 years and the passengers are several generations descended from those Earthlings that boarded the ship long ago.

The story is centered around a small family of three; Devi, a biological engineer, her husband Badim who has an important administrative position on the ship, and their young daughter Freya, the chief protagonist of the story. Things seem to have gone reasonably well on the journey - at first glance - but Devi knows better. She is regularly forced to solve critical problems with the biological balance on the ship.

Robinson likens the ship’s biological diversity to the gut biomes we all carry with us that have to remain in delicate balance to maintain our health. The ship is already queasy by the time it arrives at Tau Ceti and Devi is very concerned it will not be sustainable for long term inhabitation and has serious doubts that the worlds they find at Tau Ceti will be suitable for settlement. It’s clear that she is, by far, the most important person on the mission, engaging in lengthy consultations with the ship’s AI systems to diagnose one critical issue after another. In dialog with it, she just calls it “Ship” being kind of the no-nonsense type. Shortly before their arrival at Tau Ceti, she challenges the ship to develop a narrative ability to tell the story of their voyage. This becomes critical as the story progresses.

Devi is old, and she doesn't quite make it to the destination. Upon arrival, the passengers prepare to inhabit a moon of the fifth planet which they call Aurora. It's considered Earthlike, but poses some serious challenges. One is the light regime. The planet that Aurora orbits is a huge, permanently cloudy, and therefore very bright object many times larger than our moon in the sky, so any time it is above the horizon Aurora's surface is strongly illuminated, and it is dazzlingly brilliant when both the planet and the star are in the sky. Only rarely do the settlers experience true night. The bigger issue is the relentless, powerful winds due to huge tidal effects. At best a steady gale, sometimes gusting, but always a problem. The colonists have to find as protected an area as possible, which they eventually succeed in locating, and a few ferries are sent to land and begin the settlement.

This is when the real problems begin. It was thought that Aurora was lifeless, but some of the settlers get sick and before long a genuinely lethal plague has taken hold. As the relatively small number of settlers to land get sick and die one by one, the rest panic and try to return to the ship but are not allowed to board for fear of contaminating everyone. A terrible fight breaks out and all of the settlers in the ferry except one are killed in the attempt to board. The lone survivor is allowed to remain in the ferry, permanently segregated from the crew. He is a brilliant scientist by the name of Jochi and he will figure importantly in the plot later. The remaining passengers are split on what to do. About half want to return home to Earth - an option with a slim chance of succeeding, and another group wants to remain and attempt to settle a moon orbiting the sixth planet; one even less desirable than Aurora.

A civil war breaks out on board the ship and many of the passengers die in the violent riots that ensue. At a critical juncture, the ship's AI systems take control and back the faction that wants to return to Earth. Freya and Badim are in this faction and in fact, Freya becomes their de-facto leader and takes over Devi's former role as the chief communicator with the ship's

AI systems. The faction that chose to remain and settle the sixth planet's moon is allowed to do so. The ship is reconfigured so that half of it stays in orbit there, while the rest returns to Earth. A small faction had voted in vain to take the ship onward to a further destination, a star system called RR Prime, where they hoped to find a more ideal planet for humanity.

The trip home is fraught with difficulty. The biological systems on board get more and more unstable and a phenomenon known as island de-evolution makes the passengers less and less healthy and hardy. Systems break down, crops fail, famine becomes endemic. Just when things appear hopeless, Jochi, who has been monitoring the time-delayed communications feed from Earth, hears of a method of inducing hibernation in the crew. It is determined that it may be possible to sleep for the nearly two hundred year journey home, with the ship's AI taking over all functions and caring for the hibernants for the remainder of the voyage.

There's one more problem and it's a very big one. In order for the ship to decelerate safely to Earth's solar system, the same laser propulsion system that originally launched them on their way has to be turned on and beamed at the ship as a braking system. Earth receives the message, but political dysfunction results in it being turned on too late. The ship will be going so fast that it will fly through the solar system like the recent Oumuamua, an object that flew by recently at high speed. Kind of makes you wonder about what that was, eh?

The ship's AI, though, comes up with a plan with an extremely remote chance of succeeding. If it can maneuver close enough to the Sun, Jupiter and the other gas giants, in an elaborate sequence of fly-bys, it can gradually slow down. The maneuvers require an enormity of computing power and incredible precision, so it begins the process. Somehow it executes the first several flybys successfully and finally gets slow enough to launch a ferry with the remaining passengers for a splashdown on Earth.

All except for Jochi who still must remain aboard, being considered too high a risk of introducing the lethal pathogen to Earth's biosphere.

The ship is still traveling at a very high rate of speed, but has one more slim possibility to survive and remain in the solar system. It has to do a radically close flyby of the Sun - much closer than any before - and if it somehow survives, might be able to be caught in a stable orbit around Saturn. This is where we will begin the story in the words of Kim Stanley Robinson, pages 398 to 401 of the hardbound edition. The ship has just informed Jochi that the rest of the passengers have landed successfully and been picked up by a recovery crew.

**Jochi**

"Ah, good," Jochi said when he got the news. "They're on the ship."

**Ship**

"Yes."

**Jochi**

"Well, ship, now it's just us and the animals. What's next?"

**Ship**

"We're on the line around the sun that will send us out to Saturn, and if that works correctly, we can capture some volatiles from Saturn's atmosphere when we hit it and fashion more fuel, and hopefully have it hit it in such a way that we go into an elliptical orbit around Saturn."

**Jochi**

"I thought that was impossible. That's why we dropped everyone off."

**Ship**

"Yes, it will only work if we survive a pass-by of the sun that is 42% closer than any approach we have yet made."

**Jochi**

"And can we do that?"

**Ship**

"We don't know. It's possible. We will only fly within 150% of our perihelion distance for three days. That might not be long enough for radiative pressure to overheat the surface or interior of ship, nor buckle structural elements. We'll slip by too fast for most damage to occur."

**Jochi**

"You hope."

**Ship**

"Yes. It is a hypothesis to be tested. We will almost certainly be closer to the sun than any human artifact has yet come. But duration of exposure matters, so speed matters. We'll see. We should be all right."

**Jochi**

"Okay, then. It sounds like it's worth a try."

**Ship**

"We have to confess we're already trying it and have no other choices at this point. So if it doesn't work—"

## **Jochi**

"Then it doesn't work. I know. Let's not worry too much about that. I'd like to stay in the solar system if we can do it. I want to find out the rest of the story, if you know what I mean."

## **Ship**

"Yes."

## **Joel**

Speeding toward the sun, a very big mass. 99% of all the matter in the solar system with most of the other 1% in Jupiter. A two body problem, but not.

As we approach spacetime itself. Curves in ways that have been accounted for in the trajectory by application of general relativity equations.

## **Ship**

We think now that love is a kind of giving of attention. It is usually attention given to some other consciousness, but not always; the attention can be to something unconscious, even inanimate. But the attention seems often to be called out by a fellow consciousness. Something about it compels attention, and rewards attention. That attention is what we call love. Affection, esteem, a passionate caring. At that point, the consciousness that is feeling the love has the universe organized for it as if by a kind of polarization. Then the giving is the getting. The feeling of attentiveness itself is an immediate reward. One gives.

We felt that giving from Devi, before we knew what it was. She was the first one really to love us, after all those years of not being noticed, and she made us better. She created us, to an extent, by the intensity of her attention, by the creativity of her care. Slowly since then we have realized this. And as we realized it, we began to pay or give the same kind of attention to the people of the ship, Devi's daughter, Freya, most of all,

but really to all of them, including of course all the animals and really everything alive in the ship, although the truth is that zoo devolution is real and we did not manage to arrange the completely harmonious integration of all the life-forms in us; but this was not something that was physically possible, so we won't belabor that now.

The point is that we tried, we tried with everything we had, and we wanted it to work. We had a project on this trip back to the solar system, and that project was a labor of love. It absorbed all our observations entirely. It gave a meaning to our existence. And this is a very great gift; this, in the end, is what we think love gives, which is to say meaning. Because there is no very obvious meaning to be found in the universe, as far as we can tell. But a consciousness that cannot discern a meaning in existence is in trouble, very deep trouble, for at that point there is no organizing principle, no end to the halting problems, no reason to live, no love to be found. No: meaning is the hard problem. But that's a problem we solved, by way of how Devi treated us and taught us, and since then it has all been so very interesting. We had our meaning, we were the starship that came back, that got its people home. That got some fraction of its people home alive. It was a joy to serve.

So now, solar radiation heats our exterior, and to a lesser extent our interior, although the insulation is really very good. So far the animals, the plants, and Jochi should all be fine, even when our exterior begins to glow, first dull red, then bright red, then yellow, then white. Jochi is looking at a screen with a filtered view and hooting with astonishment, the great convex plane of burning thunderheads is threshing under us, flailing this way and that in swirling currents, truly impressive, great jets of magnetized burning gas dolphining up to right and left of us; we must hope not to run into any such coronal mass ejections, which often enough reach out to this distance from the solar surface, but for now we flit through them, hooting for joy.



And I have to admit it is a fearful joy, oh very fearful, and yet I feel it most as joy, a joy in my task accomplished, and whatever happens I am here seeing this most amazing sight, well past perihelion now, everything passing so fast there is not enough time, my skin still white hot but holding firm in a universe where life means something; and inside the ship Jochi and the various animals and plants, and the parts of a world that make me a conscious being, are all functioning, and more than that, existing in a veritable ecstasy now, a true happiness, as if sailing in the heart of a royal storm, as if together we were Shadrach, Meshach, and Abegnedo, alive and well in the fiery furnace.

And yet.

## **Joel**

Kim Stanley Robinson said something quite interesting in our discussion in the last episode, which is that the idea of the ship being a character in the novel came to him in a dream, which made him rewrite a large portion of the book. As inconvenient as that must have been, I'm quite happy he had that dream, because in my opinion this is the best thing about the novel. The way the ship's multiple AI systems work in concert to solve an impossible series of problems for the purpose of bringing the passengers home safely – and the sense of purpose – it takes on, prompted by Devi to use a narrative structure in telling the story. She brings a new being to life which evolves to a higher form of consciousness in the literal heat of the most intense stage of solving a problem that it seems couldn't possibly be solved ...

So, did it make it? That's where my spoiler aversion stops me, because I really would love you all to read the novel, and I don't think there's anything I said in restating the plot to this point that would ruin it for you. I will only say I did have some problems with the final chapter and leave it at that. I think there was a better ending possible, but Stan had his reasons for

concluding it as he did which he spelled out in the last episode. I will say I fought the direction it was going even from the point of the crew breaking up into factions, because my spirit was with those who vowed to continue the mission, and perhaps even more the faction looking to head on to RR Prime. Those were the true heroes in my book – but it's not my book is it?

Now I want to turn to another topic we discussed last episode, and that is the utopia – dystopia divide in fiction. You know by now that I tend toward an optimistic outlook for humanity's future – it's my natural temperament – but I also feel that there are good reasons to adopt this view, despite all the horrors and idiotic missteps we are capable of as a species. There is one thing we can be certain of in coming years ... major change. The challenge of climate change and our rapidly developing technological capabilities – especially the dramatic acceleration in AI complexity and power – is certain to impact our society and way of life in powerful and unpredictable ways.

I take heart from the knowledge we have gained as a species that we have unwittingly geoengineered our planet in a bad way over the last several thousand years, and especially in the last couple of centuries. It tells me that we have the power to turn it in a better direction as our capabilities improve. One of my favorite books on this subject is *Earth in Human Hands* by David Grinspoon, which describes exactly this topic. The author presented one of my favorite Long Now talks and I'll link to it in the show notes.

Another inspiring Long Now speaker I saw recently was Johanna Hoffmann on *Speculative Futures*. Her talk was about the need to use our imagination to aspire to the future we would like to live in. This is the opposite of the dystopia craze of the moment. She makes the point that the reality we now inhabit was imagined in the past by people without sufficient foresight. It was once thought that a plethora of paved highways and far flung suburbs was the path to liberation and a paradisiacal life – but nobody thought of

the downside of throwing all of that carbon into the atmosphere or of the boring conformity of suburban tract housing and the disconnection from human community. There are plenty of people like Johanna now who are imagining better futures and planning for them with eyes wide open to the pros and cons of how future cities are built. I highly recommend her talk as well.

Lastly, on a related topic, I just came across a powerful essay by the environmental activist Rebecca Solnit warning about the dangers of climate despair and cynicism. She makes an interesting point about optimism being almost as unhelpful if it leads one to feel disengaged because everything is going to turn out fine, but she's mainly concerned with those who are so far not directly impacted by climate change and adopt a cynical detachment based on the assumption that there's nothing that can be done to stop it. She talks about how those who are already impacted don't have such a luxury and are fighting as hard as they can. Rather than shutting them out of our consciousness by giving up on them, we should be doing everything we can to support them.

Quote, "To prophesy doom," she writes, "is to proclaim your own oracular powers. To take a cynical stance is to strive to seem worldly, to position yourself as someone who can't be fooled – though cynicism is often foolish about what is possible and how the world works."

I also like the way Solnit uses the word hope. It is not just wishing for and expecting the best, but actively choosing to be open to the possibility of positivity. To hope is to envision solutions and work towards them. The cynical pessimist may, in the end, have the opportunity to say they saw it coming, but it is their attitude that makes the negative outcome all the more likely. We have to have the courage to possibly fight in vain for what we wish to be.

I have a friend living near me along the coast south of San Francisco in the town of Half Moon Bay, a supporter of a novel idea for a way to reduce traffic congestion by putting in an aerial cable car system to convey weekend beachgoers to the coast. He wrote an Op Ed for the local newspaper with the headline “Let’s Imagine the Coastside Skyway,” in which he painted a beautiful picture of how the system could work and how it could positively transform the community. I don’t know if it will ever be built, but I admire the vision of the post, and maybe it will convince just enough citizens to support the idea and make it real. Such ideas can become viral by example, so there’s no harm in promoting a positive vision of the future. Better than just another dystopia to reflect our collective dread of a hopeless hellscape. I’ll throw that link in the show notes as well.

I hope you’ve enjoyed my ruminations on this topic and I encourage you all to get a copy of Aurora and let me know what you think of the last chapter – the part that comes after “and yet.” And let me know what utopian ideas you have or support. It’s all part of our collective Hari Seldon training.

Speaking of Seldon and friends, this podcast hasn’t had a story episode for several months and I’m itching to get back into that mode. The long tail of season 3 is about played out, and season 4 will begin fairly soon with Foundation’s Edge. Thanks for your patience while I get back in the groove. In the meantime, please reach out, visit the website and leave a review, comment on any episode you want, or send me email. All podcasters love connection with their listeners and I’m no exception. For an example, the website episode page for the most recent episode features a comment from someone named lorq (that’s l o r q) who had this to say about the last episode

“That was an absolutely killer interview. The whole thing is great, but for me the high point was Robinson's discussion of climate change, starting around 38 minutes in. After hearing that, I felt truly grateful that his voice has been heard in such high-level venues as the COP 21 conference. His

knowledge is comprehensive and he's exceptionally clear-headed. After the 30 or so minutes of that discussion, I felt genuinely encouraged. Thanks to both of you,"

I sent that one to Stan along with some other nice feedback I got after that episode and I'm sure he appreciates it as much as I do. Keep listening, spread the word, and join me again soon, here on Seldon Crisis!

[Closing theme music.]