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The Akastral Voyager

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The Akastal Voyager

by

Christian Rego

**A Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Fine Arts in Visual Communication Design**

School of Design

College of Art and Design

Rochester Institute of Technology

Rochester, NY

2023

Thesis Approval

The Akastral Voyager

Thesis Title

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Thesis Author

Submitted in partial fulfillment of the requirements for the
degree of Master of Fine Arts
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Abstract

This project looks to depict a realistic interpretation of a space colony that places a great focus upon pastoralism. This is done in order to provide a more optimistic counterpoint to the prevalence of dystopian pessimistic themes common throughout a majority of science fiction. In essence, rather than being a warning of what the future may hold, it is intended as a possible direction that could be aspired towards. How might we go about portraying a kinder, more optimistic future that we actively aspire towards in the long term rather than seek to avert? Moreover, what sort of design opportunities does technological projection and advancement pose for us as a species? We should envision what an isolated example of a futurist location that showcases technological possibilities could possibly look like, and present it in such a way that it evokes the feeling of wanting to spend time there. The Akastral Voyager presents a look into a future that perhaps isn't quite so bleak as we may often fear. Like its namesake, the Voyager 1 space probe, it seeks to be a symbol of humanity's will to seek out and dwell amongst the stars. We as a species still have countless horizons to seek out and places to find our own dwelling, and the Akastral Voyager represents that quite well. It's a vision of us taking a piece ourselves and our world wherever we go, something that's very innately human.

Keywords: 3D Visualization, Space Colony, Agrarian Futurism, Megastructures, Pastoralism

Essay

Problem and Solution

When it comes to our typical media depictions of the future, the practical range of those depictions tends to be somewhat restrictive. The science fiction genre has largely focused around dystopian and pessimistic views of the future in order to explore the issues with our current societal trajectory and how they may come to impact us in the future (Ambalal Mahida, 2011). While that is absolutely valuable in its own right, it also comes with its own set of consequences. It's not healthy for our society to look to the future exclusively with the purview of the dangers it presents, as that presents our future being dark as a foregone conclusion which cannot be averted. We have plenty of media focused around a society we should aspire not to be, but are lacking in media focused around what we should aspire to be. Even modern shows that do present a more livable sort of interpretation of the future, like *Futurama*, tend to do it under the veneer of cynicism and satire. In order to tackle this issue, this project is meant to ask the following: How might a kinder, more optimistic future, that we actively aspire towards in the long term rather than seek to avert, be depicted? Moreover, how can technological projection and advancements offer design opportunities for a positive future?

How *The Akastral Voyager* seeks to tackle this issue is as such: We should envision what an isolated example of a futurist location that showcases technological possibilities could possibly look like, and present it in such a way that it evokes the feeling of wanting to spend time there. For example, by representing it through the concept of something that is functionally a place of leisure, like a resort. The primary visuals to be used would be 3D rendered approximations of what the spacecraft would look like, compiled into a webpage resembling a travel destination website. This is the basis from which "The Akastral Voyager" project grew.

Design

There were a number of ways a project like this could be tackled, but in *The Akastral Voyager's* case, it was clear from the beginning that it should primarily take inspiration from solarpunk, a modern counter-cultural art movement that seeks to combat the very same issue that's been outlined. The term solarpunk takes from its more pessimistic contemporary peers, like cyberpunk, in depicting a vision of the future. However the primary difference is that it represents a more hopeful future in which self-sufficient and sustainable designs are prioritized and our design language takes greater effort to incorporate aspects of pastoral living, even in heavily urban environments. It not only represents a certain aesthetic, but also its own set of ideals. Solarpunk is explicitly a vision of hope for humanity getting its act together and combating issues like climate change in ways that serve to enrich our lives (Reina-Rozo 2021). In this way, it only makes sense to look to solarpunk as the primary visual and philosophical design theory which *The Akastral Voyager* should base much of its design upon. Much of the project ended up focused around making *The Akastral Voyager* as self-sufficient as possible, as though it were its own ecosystem. Much focus was placed upon the mechanisms of the layered function system, where each area had a designated purpose that would feed into one another in a cycle. The spacecraft is entirely solar powered, utilizing two massive "wings" of solar panels to gather all of the energy it requires.

The Akastral Voyager's containment of an organic habitat that resembled natural forest environments on Earth was nailed down right from the very beginning. It was the best possible way to embody the discussed concepts, as space is an inherently hostile, but not necessarily uninhabitable, environment for biological life. So seeing life in abundance while in said environment is immediately striking and a hopeful visual, as though to say, "even if the conditions of life aren't favorable, we are still capable of thriving." *The Akastral Voyager's* primary draw is in how it replicates a natural environment whilst still within an entirely man-made celestial body confined to space, blending artificiality and nature in

a symbiotic way. Despite all of our advancements, humans are still animals that originate from Earth, and that's not about to change any time soon. There's just a natural draw between humans and nature, which is the reason an appeal to pastoralism is necessary no matter how far we advance. Even while still on Earth, urban environments like cities require greenery through park areas and street trees in order to maintain a high standard of living (House 2016). It serves not only an aesthetic purpose but more importantly it serves a functional purpose, even putting aside the shade it provides, being vital to the mental wellbeing of most people to not be entirely confined to artificiality. The Akastral Voyager functions on an identical logic. It incorporates plantlife wherever possible, and the "open-air" layer is functionally a massive park that provides both air filtration as an aid to the self-sufficiency of the spacecraft, and just beauty of its own.

Development

The Akastral Voyager began as a fairly amorphous concept with only the broad strokes and overarching themes nailed down. The aim was not to depict a utopia, but to look in the direction of something that seems legitimately feasible within, if not our lifetime, potentially our immediate descendants' lifetimes. But early on in the development of the project, it wasn't quite clear the degree to which it should adhere to established technological developments. The original ship design featured a primary sector and eight attached sectors, along with a contained miniature star used for thrust. This would have required some insane technological developments for it to ever be replicated. The design would eventually settle on fewer assumptions of future technological developments and instead gravitate more towards proven theoretical concepts that simply require more infrastructure to develop, but could hypothetically be developed now with the appropriate resources. In the original design, each sector would have been broken up into components by individual purpose. This would include a biodome, an underground area, a functions and utilities area, and a ship engine. While this did not make its way to the final design wholesale, it did become the basis for the layer system that serves an identical purpose, separating areas of the colony by their primary function.

With further research done on hypothetical space colony designs, the final design eventually landed more firmly in the realm of established futurist space colony concepts, settling into using what's referred to by NASA as the "Toroidal Colony" design, or the Stanford Torus (Johnson 1977). The Stanford torus is a large, donut-shaped structure that rotates in space, and it's arguably the most feasible design for a space colony where the need for some kind of artificial gravity substitute exists, as its rotation would provide an outward force through the centrifugal effect. The simple design and usage of centripetal force makes it very easily understood and requires it to use the fewest possible assumptions of future technological developments in order to feasibly portray. It primarily just requires an electrical motor which could easily be solar powered. Simply seeing it allows you to get a good idea of how it functions. The gravity gradient as you move closer to the center is also appealing for recreational purposes.

The primary tool used for developing the Akastral Voyager was Blender. All modeling and texturing was done from within the program using few outside resources. Though, there was also post-processing and color grading done through Photoshop for the stills and Premiere Pro for the animations.

I chose to also expand the context of what exactly the Akastral Voyager is, romanticizing it. I likened it to just one island in a space archipelago. The main purpose of this is twofold. First, it gives an easy concept to latch onto as a parallel, which makes its purpose more easily understood. Second, it evokes ideas of intercolony travel, hopping from "island" to "island." I believe the idea of mankind being able to make its own living space off-planet is one of the greater aspects of the space colony concept, but being confined to a single vessel diminishes the luster quite a bit. Decommodifying space travel is

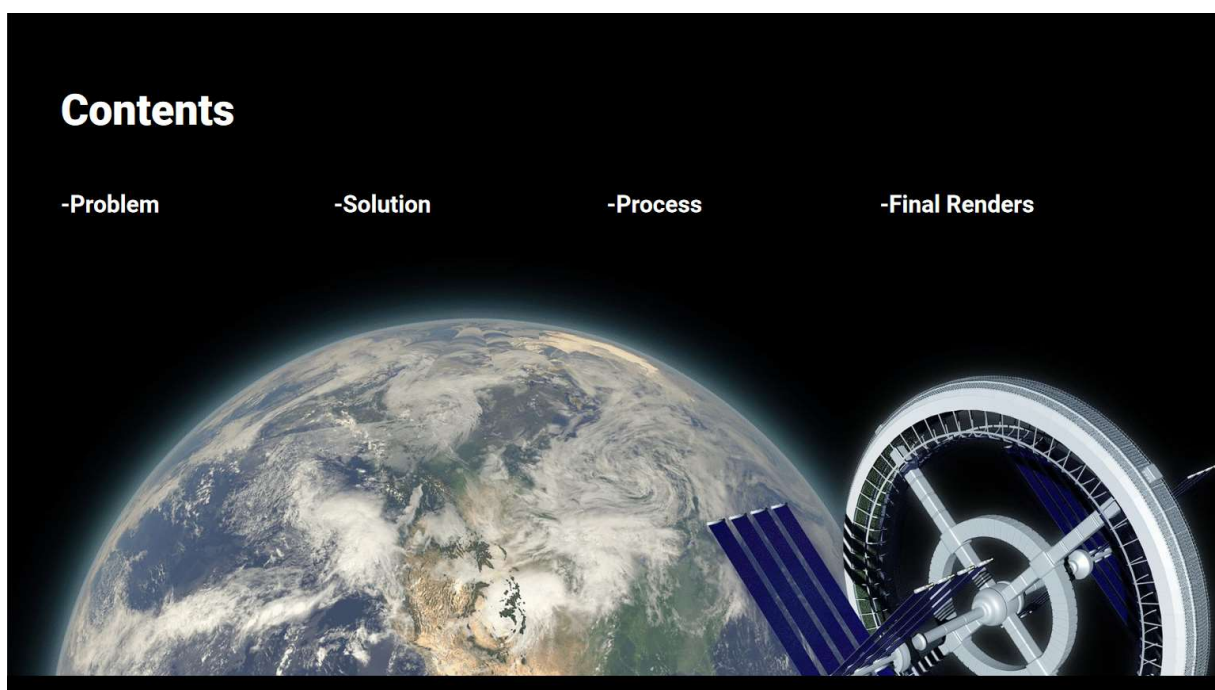
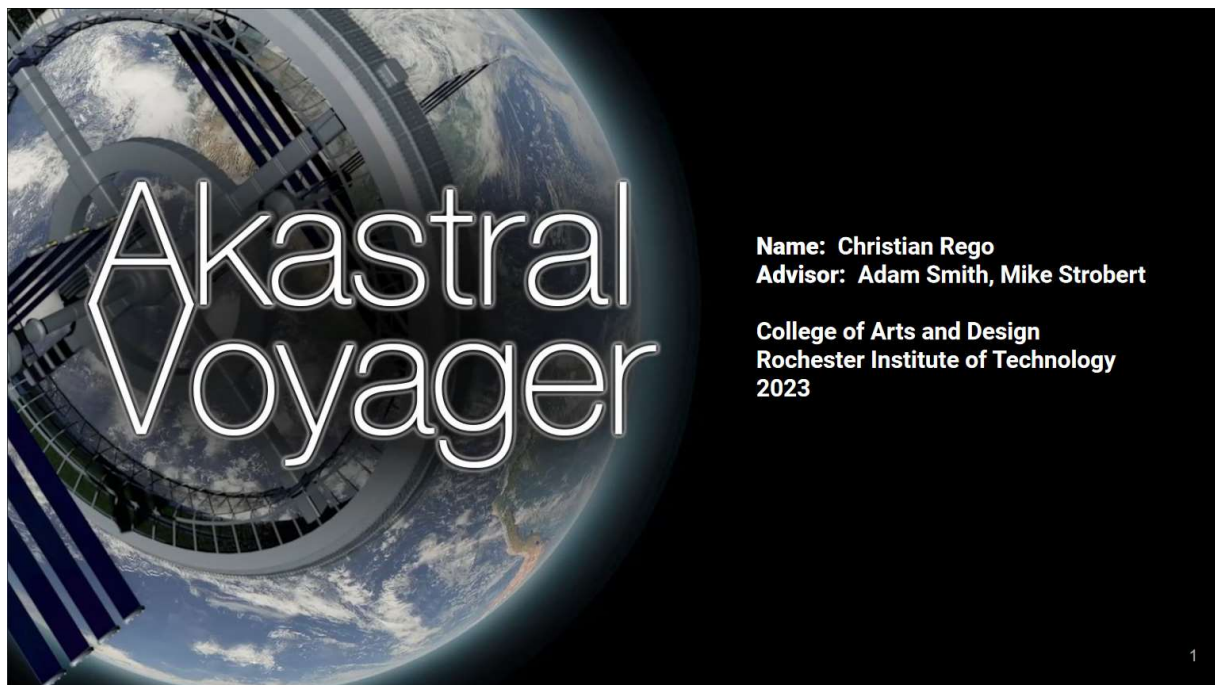
something that needs to be done for comfortable living in this sort of design, and this gives the implication of such a scenario.

Conclusion

The Akastral Voyager is a symbol of the infinite potential of humanity to expand our scope beyond our source. It presents a look into a future that perhaps isn't quite so bleak as we may often fear, and like its namesake, the Voyager 1 space probe, it seeks to embody humanity's curiosity and its will to seek out and dwell amongst the stars. We as a species still have countless horizons to seek out and places to find our own dwelling, and the Akastral Voyager represents that quite well. It's a vision of us taking a piece ourselves and our world wherever we go, something that's very innately human.

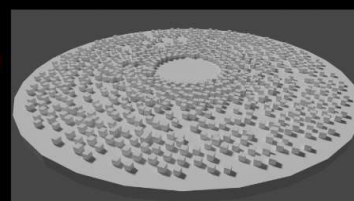
It is inevitable that The Akastral Voyager will not accurately predict the future that we eventually end up at. If you look at much of the futurist artwork of the early 20th century, you'll notice that much of it failed to take into account very important factors, it doesn't acknowledge much about how our cultural values change, and it misjudges which technological developments are most reasonable. However, it served a purpose. It gave us a look into a brighter future and encouraged people to pursue it with all of the power they have. That's something quite necessary right now.

Appendix A: Expanded Thesis Defense Presentation



The Problem and its Significance

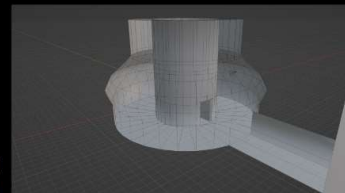
When it comes to our typical media depictions of the future, the practical range of those depictions tends to be somewhat restrictive. The science fiction genre has largely focused around dystopian and pessimistic views of the future in order to explore the issues with our current societal trajectory and how they may come to impact us in the future (Ambalal Mahida, 2011). How might we go about portraying a kinder, more optimistic future that we actively aspire towards in the long term rather than seek to avert? Moreover, what sort of design opportunities does technological projection and advancement pose for us as a species?



3

Solution

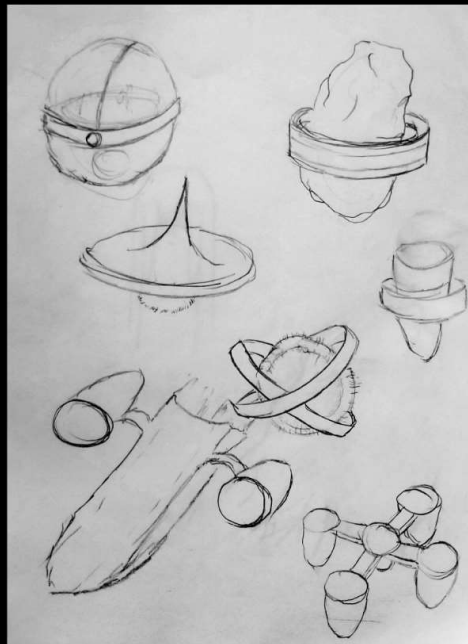
We should envision what an isolated example of a futurist location that showcases technological possibilities could possibly look like, and present it in such a way that it evokes the feeling of wanting to spend time there. For example, by representing it through the concept of something that is functionally a place of leisure, like a resort. The primary visuals to be used would be 3D rendered approximations of what the spacecraft would look like, compiled into a webpage resembling a travel destination website.



4

Development

The Akastral Voyager began as a fairly amorphous concept with only the broad strokes and overarching themes nailed down. The aim was not to depict a utopia, but to look in the direction of something that seems legitimately feasible within, if not our lifetime, potentially our immediate descendants' lifetimes, and functioned as something that could be feasibly accomplished. But early on in the development of the project, I hadn't quite settled on the degree to which I wanted that to be the case and how much I wanted to assume was possible with future advancements.



5

Development

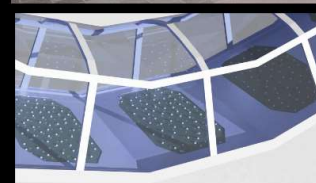
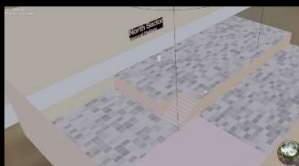
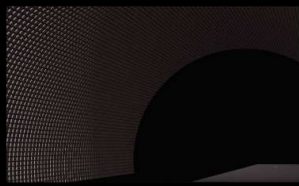
I started with a ship design featuring a primary sector and eight attached sectors, along with a contained miniature star used for thrust. This would have required some insane technological developments however for it to ever be replicated. I would eventually settle on fewer assumptions of future technological development and what we might be able to accomplish, and instead gravitate more towards proven theoretical concepts that simply require more infrastructure to develop, but could hypothetically be developed now.



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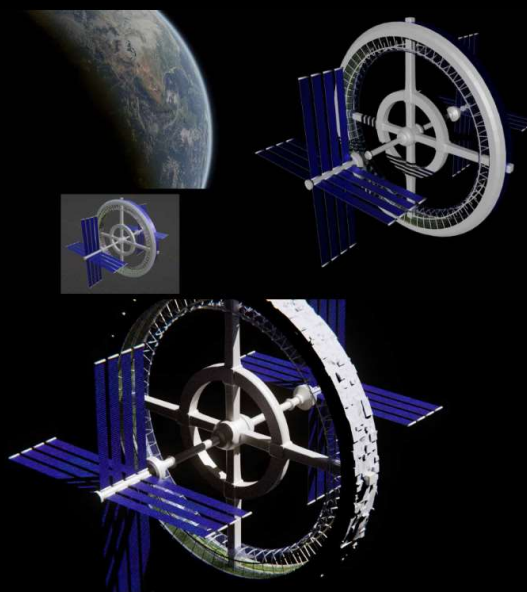
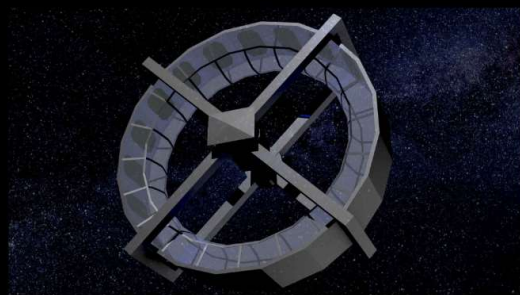
Development

My primary tool used for developing the Akastral Voyager was the 3D Software Blender. All modeling and texturing was done from within the program using few outside resources. Though, there was also post-processing and color grading done through Photoshop for the stills and Premiere Pro for the animations.



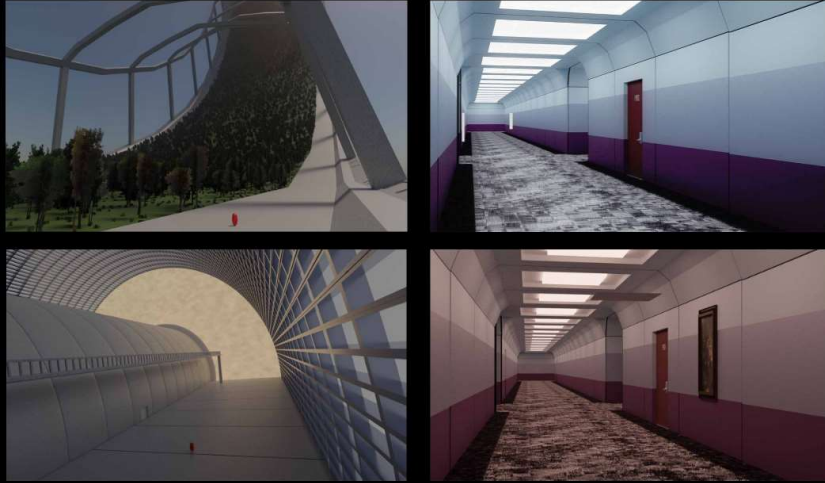
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Development

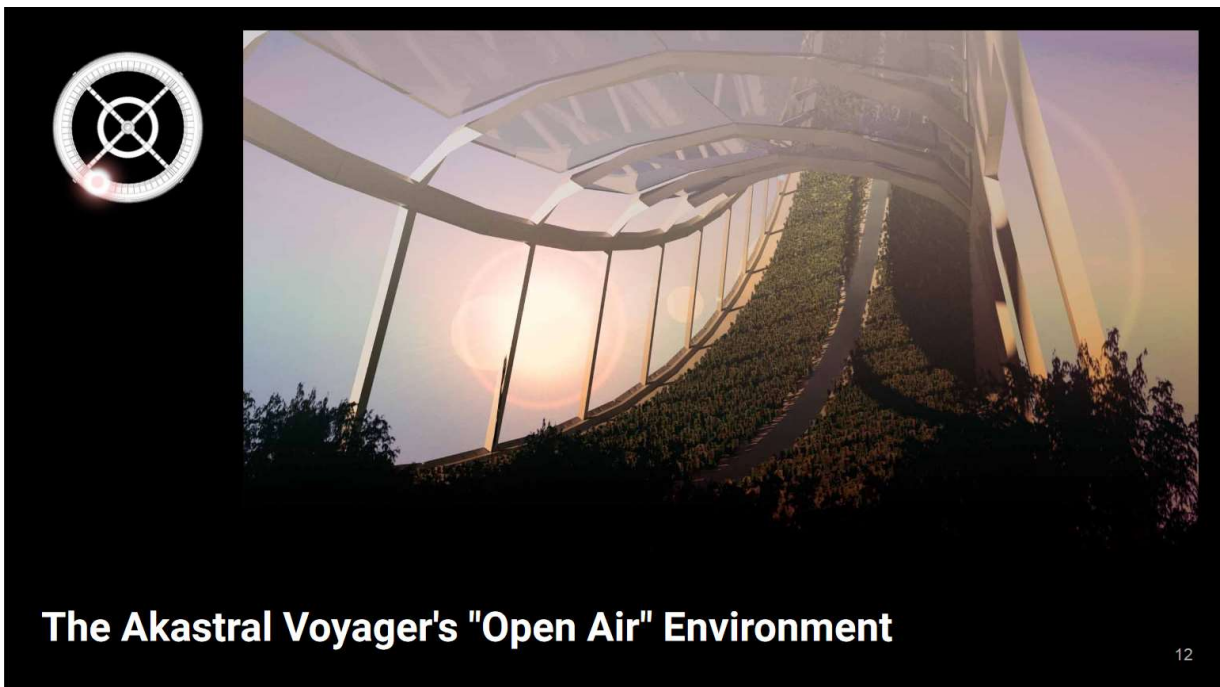
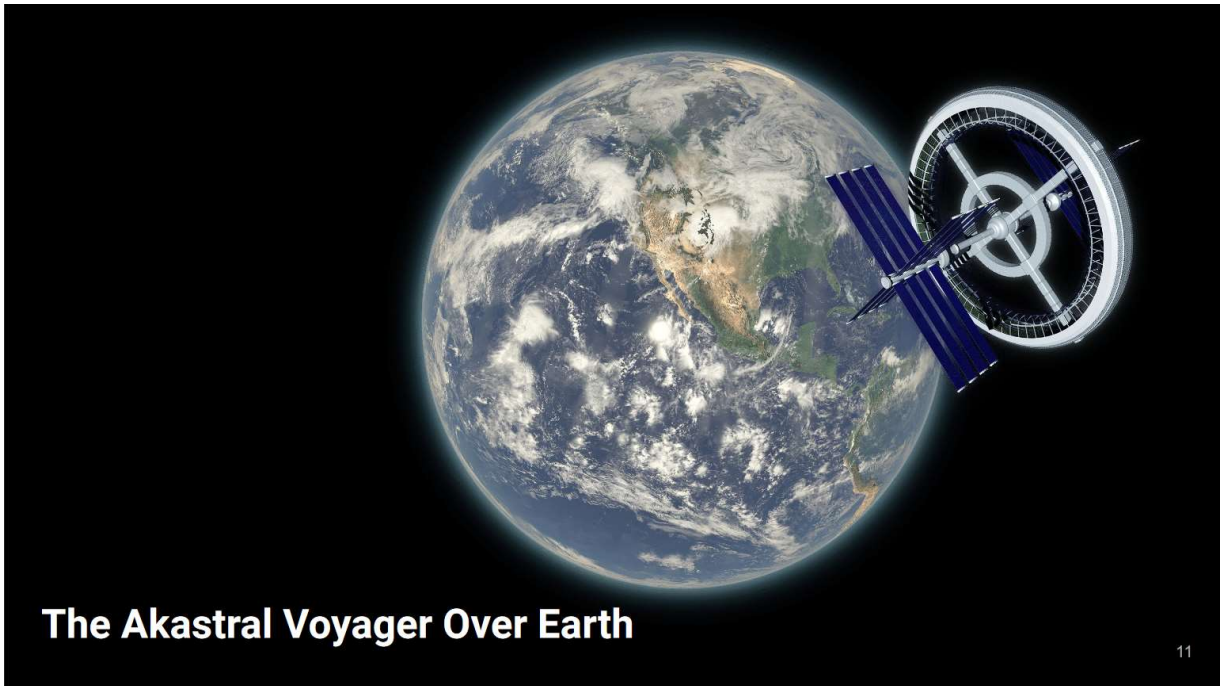


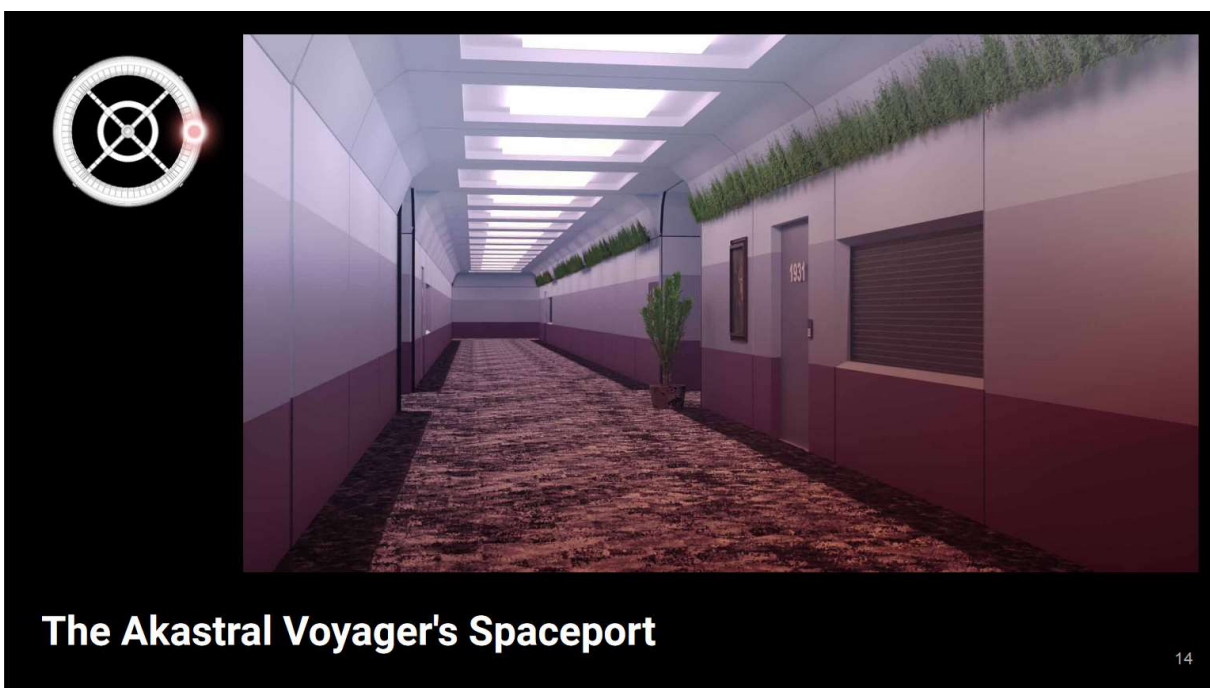
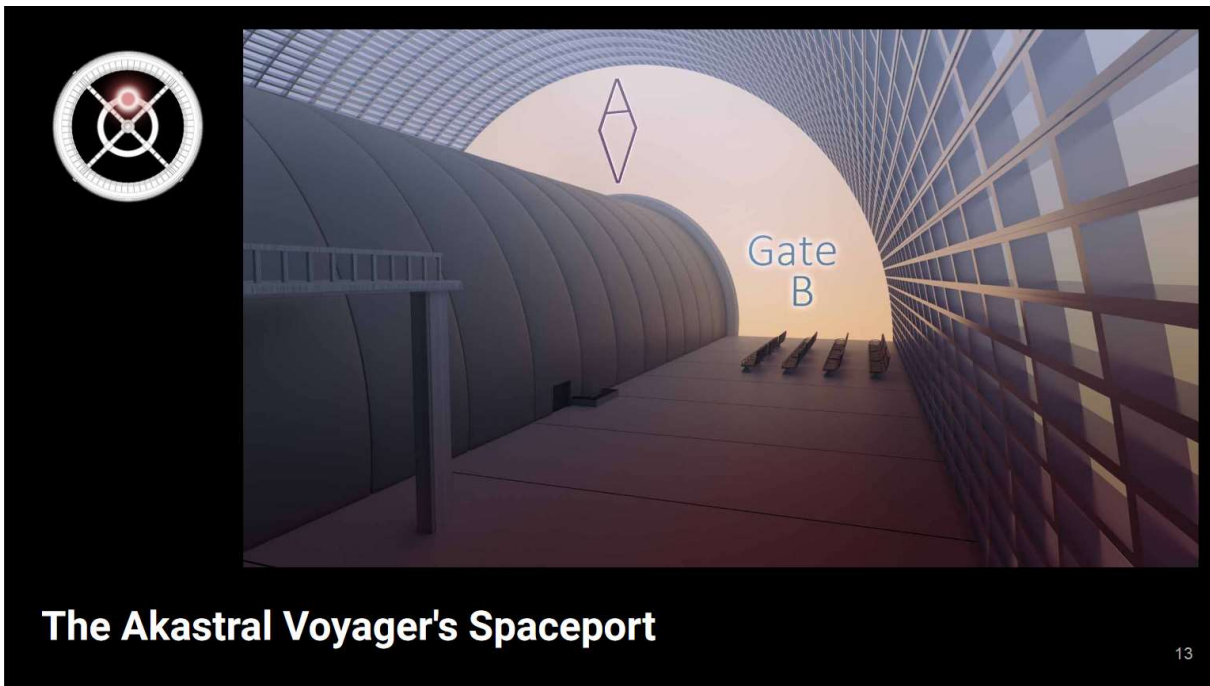
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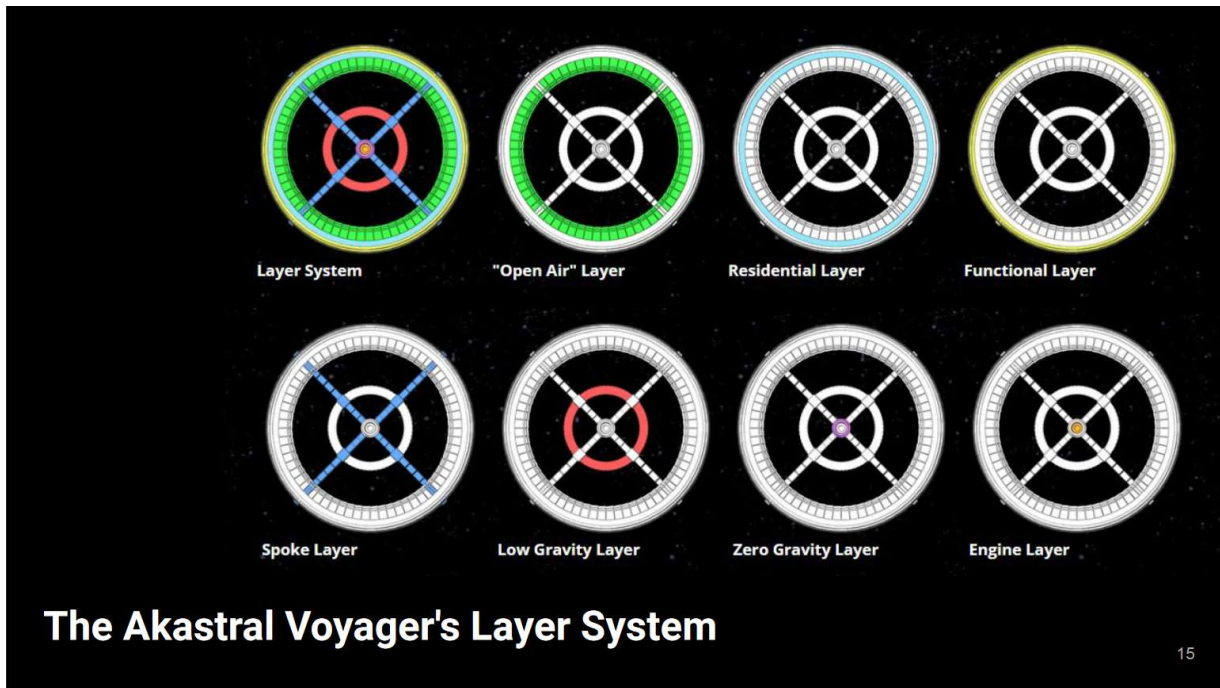
Development

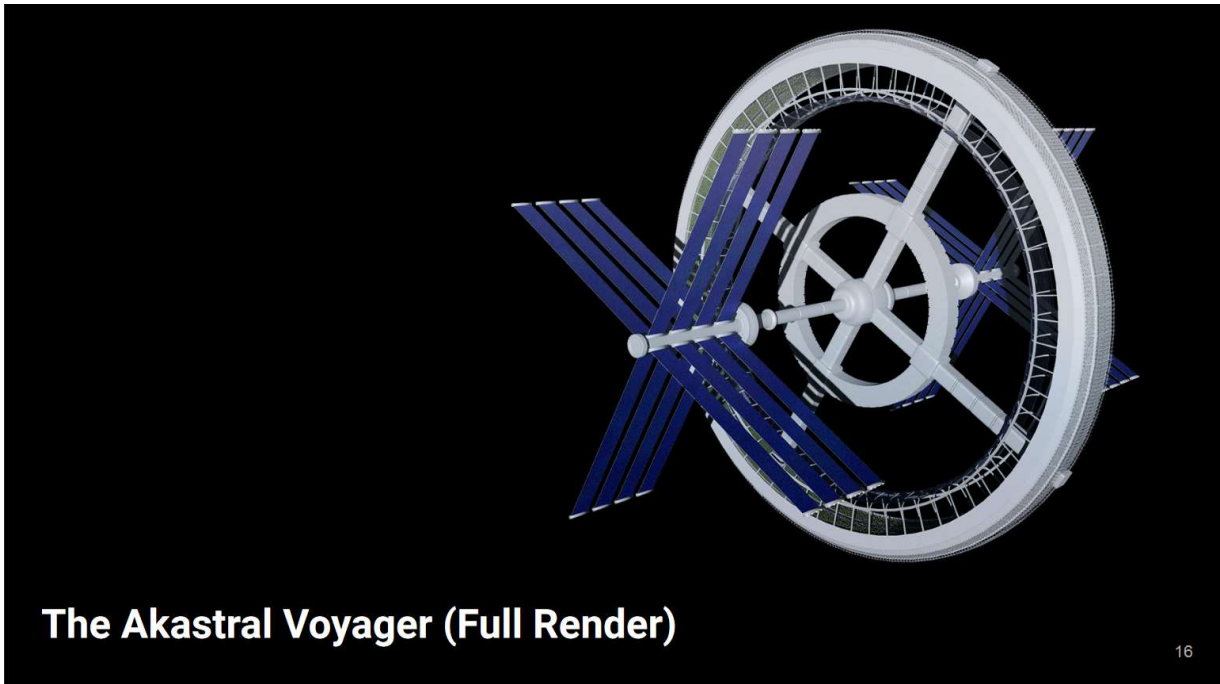


Final Renders



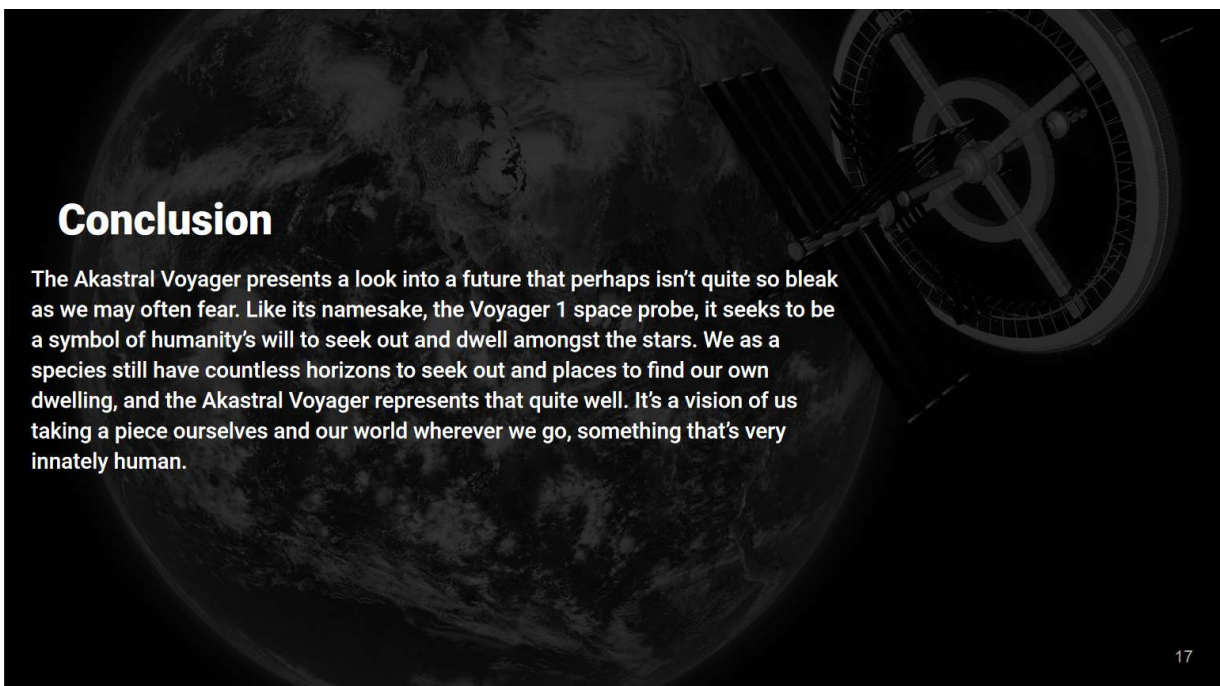






The Akastral Voyager (Full Render)

16



Conclusion

The Akastral Voyager presents a look into a future that perhaps isn't quite so bleak as we may often fear. Like its namesake, the Voyager 1 space probe, it seeks to be a symbol of humanity's will to seek out and dwell amongst the stars. We as a species still have countless horizons to seek out and places to find our own dwelling, and the Akastral Voyager represents that quite well. It's a vision of us taking a piece ourselves and our world wherever we go, something that's very innately human.

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Appendix C: Semplice Screenshot



Akastral Voyager

Project Overview

- 1. **Concept**: A satellite-based navigation system for autonomous vehicles.
- 2. **Design**: Development of a compact, low-power navigation module.
- 3. **Prototype**: Construction of a functional prototype for testing.
- 4. **Deployment**: Integration of the module into a vehicle's navigation system.

Key Features

- **High Accuracy**: Sub-meter level positioning.
- **Low Power**: Optimized for long-term operation.
- **Compact Size**: Fits into standard vehicle components.
- **Easy Integration**: Plug-and-play architecture.

Benefits

- **Improved Safety**: Reduces the risk of navigation errors.
- **Cost Reduction**: Eliminates the need for expensive external sensors.
- **Enhanced Performance**: Provides reliable navigation in urban environments.

Partners

- **IMAGIN, RIT**: Research Institute for Intelligent Navigation Systems.
- **Autonomous Vehicle Manufacturers**: Collaborating with leading industry players.

Conclusion

The Akastral Voyager project represents a significant step forward in autonomous navigation technology, offering a reliable and cost-effective solution for the future of self-driving vehicles.



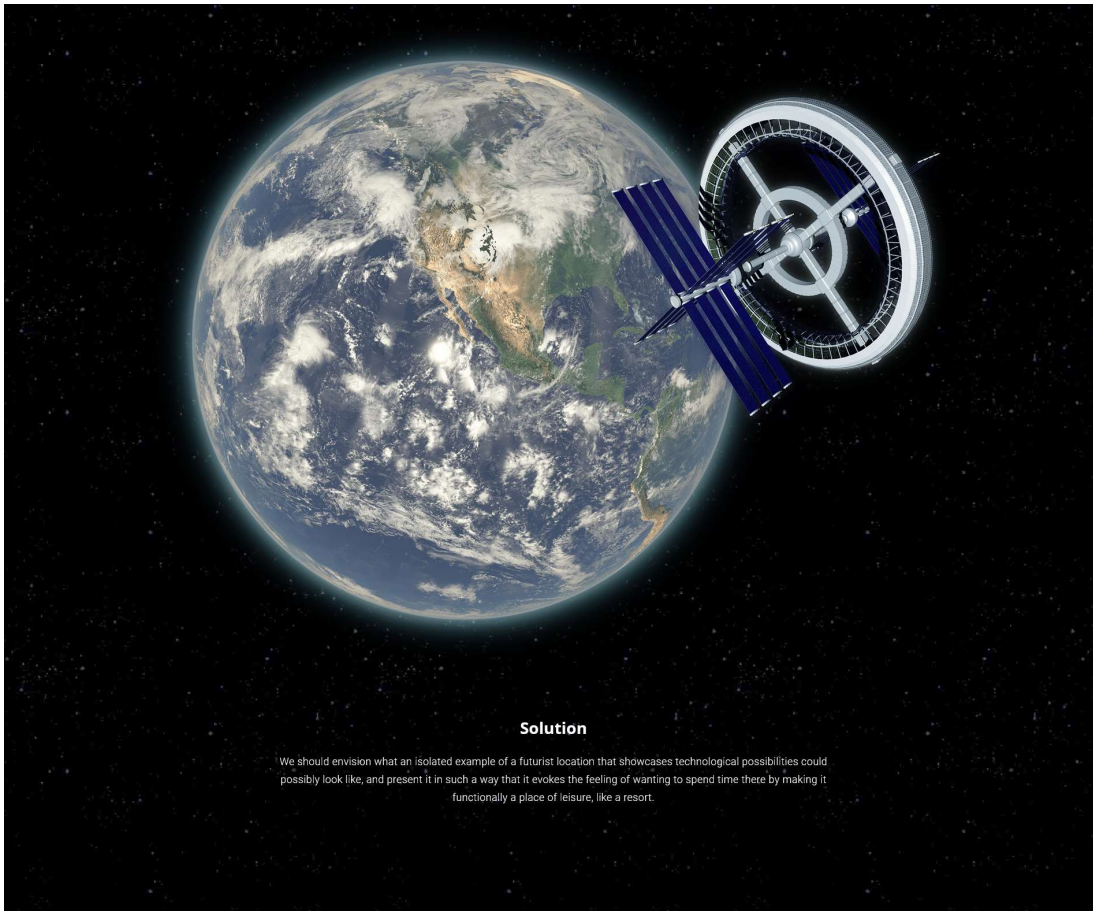
In our modern era we have a tendency to look to the future in terms of a dystopian environment rather than with much of the optimistic qualities typical of early 20th century futurism. While this serves the purpose of preparing for future crises, it does not hold much room for what we should be aspiring towards, and therefore imposes an overwhelming sense of pessimism and defeatism towards the future.

Prompt

How can we visualize a lens into our own future that we actively might aspire towards rather than seek to avert?

Problem

What design opportunities does technological projection and advancement pose for us as a species?



Solution

We should envision what an isolated example of a futurist location that showcases technological possibilities could possibly look like, and present it in such a way that it evokes the feeling of wanting to spend time there by making it functionally a place of leisure, like a resort.

The Akastral Archipelago

The Akastral Archipelago is a union of space colony resorts each with their own separate purpose. They are called as such because, when viewing space as a sea of stars, the union of colonies function akin to a series of islands that can be jumped between by means of a more predominant form of space-faring vessel. What follows are a handful of the "islands" that can be found on the archipelago:



The Akastral Voyager

A resort space colony with an emphasis on creating a self-sustaining environment much like Earth's in space.



The Akastral Identity

A resort space colony with an emphasis on replicating an urban environment.



The Akastral Crystal

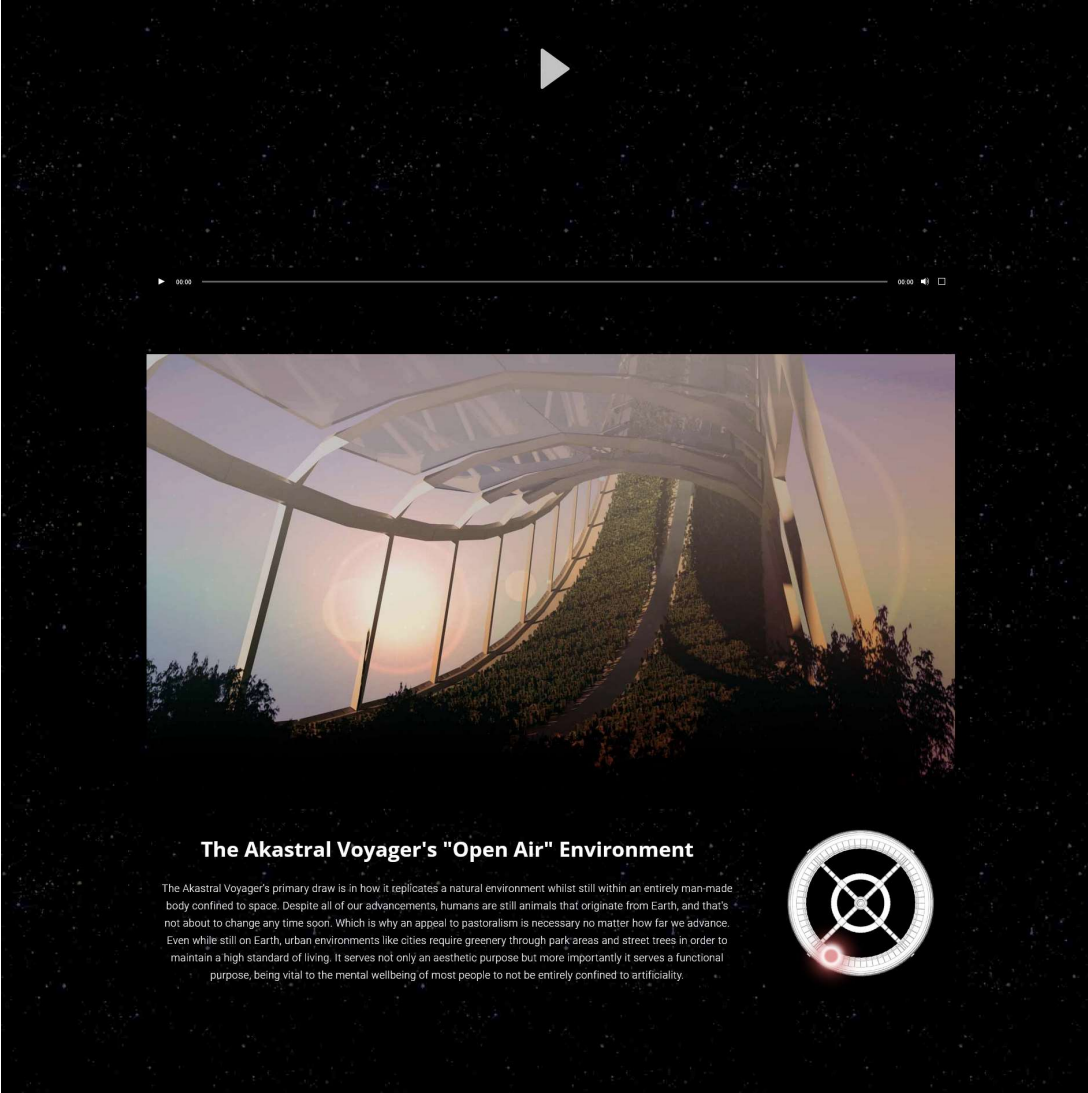
A resort space colony with an emphasis on providing the ability to observe the solar system.



The Akastral Ascent


A resort space colony with an emphasis on creating the ideal environment for training athletes.

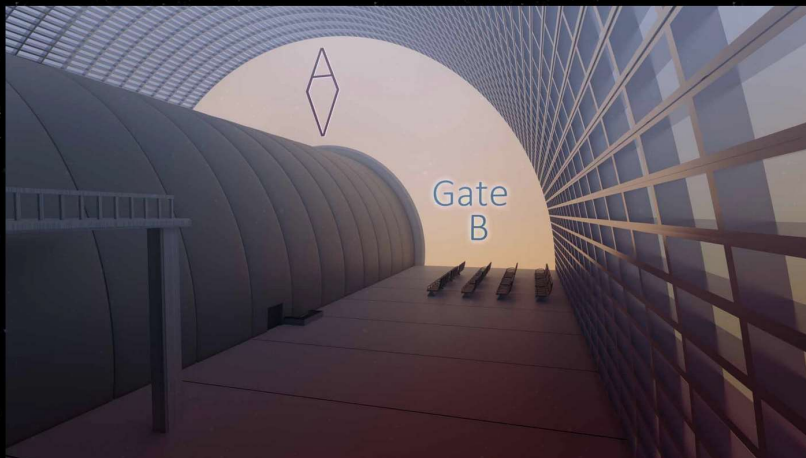
This presentation will focus solely on the first island, the "Akastral Voyager."



The Akastral Voyager's "Open Air" Environment

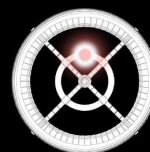
The Akastral Voyager's primary draw is in how it replicates a natural environment whilst still within an entirely man-made body confined to space. Despite all of our advancements, humans are still animals that originate from Earth, and that's not about to change any time soon. Which is why an appeal to pastoralism is necessary no matter how far we advance. Even while still on Earth, urban environments like cities require greenery through park areas and street trees in order to maintain a high standard of living. It serves not only an aesthetic purpose but more importantly it serves a functional purpose, being vital to the mental wellbeing of most people to not be entirely confined to artificiality.





The Akastral Voyager's Spaceport

Arrivals and departures within the Akastral Voyager are done primarily through one of four gates on the low gravity layer. Humanity should aim to develop more widespread and less commodified usage of interstellar travel as a means of, for the first time in our history, the ability to create more space. Visualizing a series of space colonies as an archipelago is all well and good, but it only functions close to one when the means of 'seafaring' isn't as difficult to accomplish as it currently is for us.



The Akastral Voyager's Accomodations

With the idea of a resort in mind, the Akastral Voyager's design is primarily influenced by contemporary hotel aesthetics, deferring to cruise liners while keeping in mind that these apartments function more as cabins than typical hotel rooms. One of the benefits of fully manufacturing a colony in space is that you don't need to conform to the environmental factors like elevation. If you hold the materials and means of development necessary, then they can suit most designs.



Layer System

The Akastral Voyager is a massive spacecraft, and therefore must artificially produce and maintain the circumstances that allow human life to flourish. The layered system is designed with this in mind.

10km circumference.

"Open Air" Layer

The primary appeal of the Akastral Voyager is its massive spacebound recreation of Earth-like conditions away from Earth proper. The "Open Air" layer is meant to most closely resemble an Earth atmosphere.

1.5 km from center.

Residential Layer

Sectioned off from the forest above is the residential accommodations of the Akastral Voyager. This area functions close to a resort with a more chic modern aesthetic.

1.54 km from center.

Functional Layer

This layer is primarily out of sight and performs all of the tasks required for the vessel to properly function, including air filtration, food production, material manufacturing, satellite connectivity, heat radiation, and so on.

1.59 km from center.

Spoke Layer

Aside from functioning as the support beams used to facilitate the rotation of the space colony, the spoke layer provides elevators in order to traverse between the core cylinder, the inner ring, and the primary ring.

Low Gravity Layer

This layer serves as a lower gravity area used both for recreation and used as the primary port for the space colony. Arriving vessels enter in this area and sometimes may be stored for prolonged periods of time.

0.7 km from center.

Zero Gravity Layer

The zero gravity layer is another much smaller gravity based recreational area that sits just outside of the engine.

0.2 km from center.

Engine Layer

The engine layer provides one of the core necessities of the space colony. That being artificial gravity produced through the centrifugal effect of the rotating spacecraft. It is also directly connected to perpendicular beams in the exterior that gather electricity from sunlight for the spacecraft.

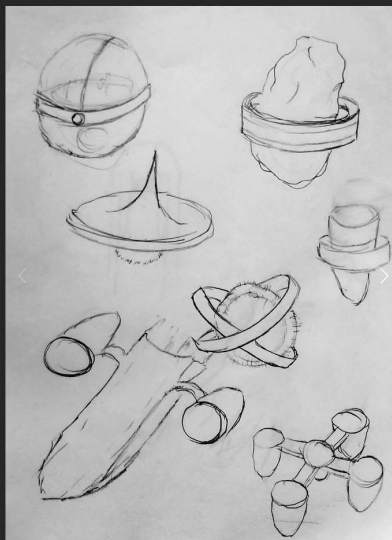


Process

The Akastral Voyager began as a fairly amorphous concept with only the broad strokes and overarching themes nailed down. I sought to make it a space colony and have it contain an organic habitat that resembled natural forest environments on earth.

As I did research on hypothetical space colony designs, I eventually landed away from the more abstract and fantastical designs I had started with and landed more firmly in the realm of established futurist concepts, settling into using the Stanford torus template. The Stanford torus is a large, donut-shaped structure that rotates in space, and I personally view it as the most reasonable design for a space colony where the need for some kind of artificial gravity substitute exists. The simple design and usage of centripetal force makes it very easily understood and requires it use the fewest possible assumptions of future technological developments in order to feasibly portray. It primarily just required an electrical motor. Simply seeing it allows you to get a good idea of how it functions. The gravity gradient as you move toward the center also appealed to me. Mundane areas with low gravity have a unique appeal in sci-fi settings.

To the right is an image gallery containing a snapshots of the development process of the Akastral Voyager.





Visual
Communication
Design
MFA

Communication
Interaction
Motion & 3D
Design Studies

About the Program