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AURORIUM, The Architecture of a Phenomenon

by

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A THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF
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April, 1999
Abstract:

Aurorium, *The Architecture of a Phenomenon*

January 10th
1:00 AM
-20°Farenheit

Wading through the knee-deep snow, the air is cold, stinging your cheeks and sharpening the world around you to a crystalline clarity. Far from the artificial lights of human habitation, the night, which seems at first the depth of blackness, becomes subtly illuminated by colors cast across the pristine canvas of snow by pinpoints of stars. You penetrate a clearing in the trees and the sky opens above you. Like some elusive wild animal, green fire coalesces briefly overhead only to fade from view as soon as it is perceived. You wait breathlessly and are rewarded by a dance of color and light that surpasses the imagination.

This is the experience of the *aurora borealis*.

A phenomenon which seems at first incomprehensible and chaotic, is upon further study interwoven with a complex collection of cycles and patterns and is itself merely the surface of an even larger system. The process begins with an examination of the viewer’s connection to the phenomena, filtered through his or her personal context within the relationship of ground, horizon and sky. The design of the Aurorium derives from an exploration of how, space and form can physically modulate and emphasize the viewers understanding and experience while maintaining the inherent mystery of the phenomenon itself.
Acknowledgments:

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April 1999
Timothy Gordon
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1. what is an aurorium?
**Aurorium:** A structure used for the viewing of a large-scale exterior phenomenon, the aurora borealis, in a latitude / climate where enclosure is necessary.

Although the aurorium archetype has never been built or formally designed, it is regionally a well-known concept that has been hypothesized by both the press, public, and the scientific community. This thesis design endeavored to create a structure that would promote sensual experience, and the physical understanding of the natural phenomenon known as the *aurora borealis*. It was critical to address the issues of experience and understanding as the building must function throughout the year and must be both a space of experience and a space of learning. My initial effort focused on gathering an understanding of the physics involved in the creation of the aurora which I then interwove with an abstract formal conception of a phenomenal experience. From these standpoints, I explored the possible role of architecture within the relationship between the viewer and the event. A conceptual design strategy was formulated and then applied to the chosen site in Fairbanks, Alaska at which point issues of site and cultural context were integrated into the design.

**The Nature of the Structure**

The aurora seems at first totally random, but is actually a multifaceted phenomenon interwoven with patterns which mean different things to different people. To the Eskimos it is a game played by the gods with a walrus skull for a ball. For us the aurora is a quixotic animal glimpsed only fleetingly. For scientists the aurora embodies a window to the patterns and cycles of interaction between the earth and the sun as energy particles from the sun enter the earth’s atmosphere.

As one would expect, winter is a constant presence in the minds of Alaskans. Growing up in Alaska, the aurora borealis was always a harbinger of the winter season. As the snowshoe hare trades in its summer coat and the air attains the sharper clarity that accompanies the cold, the aurora is a mythical creature that inhabits the night skies.
As scientists now know, the auroral phenomenon is constantly present throughout the year, day and night, but within the auroral zones of the north and south poles the extended hours of the summer sun hide the auroral phenomenon from view.

I chose to accept a poetical view of the aurora in light of its cultural history and the sensual impact of auroral experience. While researchers have gained a greater understanding of the phenomenon in the past two decades, poets and astronomers have chronicled their study of the aurora for over a thousand years. Legends hypothesizing the origin and meaning of the aurora date from the time of Aristotle. I have spent many winter hours bundled against the cold, lying on my back on the snow simply watching the dance of lights snaking directly overhead. When witnessing the aurora borealis, even with knowledge of the physics involved, it is difficult to believe the phenomenon is not somehow alive. The surpassing scale of the aurora, its seeming unpredictability, and its connection to a much greater reality cause the viewer to interrogate his or her own placement in the world around us. Thus the formal and conceptual design of the Aurorium must be formulated as a poetic response to the dance of the Northern Lights. It must fulfill scientific curiosity while still maintaining a sense of mystery and wonder.
From the first conception of this thesis there were five issues which were critical to the development of the design. These issues were taken as benchmarks or guidelines and helped to drive the project through both its conceptual and design phases.

1. **Aurora**: The physics and mechanics of the phenomenon and how they are reflected in the program and structure of the design.

2. **Transparency**: For an aurorium transparency in a literal sense to maximize the impact of the experience. If transparency must be inherent in the design at a literal level, then the design should reflect this at a phenomenological level as well.

3. **Cycles**: The awareness of the design for its focus, the aurora borealis which is subject to the cycles of the earth and sun, and the responsiveness of the design to its context / site, a natural habitat which is hyperconscious of the cycles of the season and the responses of its natural inhabitants. In an era when disposability reigns supreme, time flows over and around the aurorium causing some changes, but allowing it to remain as a silent witness to the slow evolution of its surroundings.

4. **Enclosure**: The issue of the harsh climate during the winter, which covers the height of the auroral season, where temperatures commonly reach 50-60 degrees below freezing for weeks at a time must be taken for granted in the design and formulation of the structure. This necessity for enclosure is what allows architecture to insert itself into this phenomenological relationship.

5. **Understanding**: The Aurorium is a space of experience, an experiment into the ways that architecture can modulate and emphasize a phenomenological experience, but it is also a place dedicated to understanding the aurora borealis. Thus it must include spaces of learning targeted to both the local population and visitors from outside of Alaska.
2. physics
Particles of the sun's outer corona are excited with enough energy that they are able to escape the sun's gravitational pull. These particles flow constantly from the sun in all directions and are called the solar wind. As the solar wind passes by the earth the particles interact with the earth's magnetic field or the magnetosphere. Some of the particles are drawn into the earth's atmosphere along its magnetic field lines. Similar to a perfect magnetic bar diagram, these fields end at the earth's magnetic north and south poles causing a simultaneous mirrored auroral event to occur over the northern and southern hemispheres.

The magnetic basins which contain these auroral reactions are called auroral ovals. These irregular torus formations remain stationary with respect to the sun as the earth sweeps out its rotation. Thus, for every location there are specific temporal windows or peak opportunities for occurrence of auroral activity. As in a neon tube, the solar particles enter the earth's outer atmosphere and collide with stray molecules of nitrogen and oxygen and other gases. These collisions cause a release of energy, which is colored according to the type of molecule involved. The band of auroral light which is created can measure one thousand miles long and two hundred miles high and may range in
3. influences
Even before focusing on the aurora borealis for my thesis, I began with a fascination for the literal and phenomenal role transparency plays in architecture. Authors and architects alike have studied the blurring of spaces or uses that seem distinct and the ramifications of merging interior with exterior. This interest, when paired with the physics and metaphysics of the aurora, felt like a perfect match for my continuing study. Following are works that deal with the issues of transparency and the relationship of form and space to natural phenomenon. These works were pivotal to the formulation of my own sensibilities and to the development of the Aurorium project.

James Turrell has created the works that seem the most directly related to the Aurorium spaces. Turrell used color and light to inhabit space and architecture as the threshold for experience. His work with vision and experience were inspirational to the development of my design process which focused primarily on the connection to nature and on experience framed by a space and not the space itself. The Roden Crater Project in which architecture is created as the canvas for natural phenomena exponentially larger in scale, mirrors literally many of the operations the Aurorium endeavors to fulfill, but it is his Heavy Water installation of 1991 which proved the most critical to my project. In this installation visitors must divest themselves of their belongings before passing beneath a partially submerged wall. This wall placed in the center of a pool encloses one of Turrell’s sky spaces. Because the visitor is required to relinquish their urban context in order to penetrate into the space they are able to experience the subsequent installation with a greater freedom and clarity. Turrell’s creation of a “spiritual environment” which allows the viewer to gain a new perspective on a natural event deals with Turrell's hypothesis of “non-vicarious space...These things turn the experience inward and make the viewer's own seeing part of the art.”
Colin Rowe outlined new definitions for transparency which served as a platform for much of the philosophical underpinning I used in my thesis. Rowe states that, “If one sees two figures overlapping one another and each claims for itself the common intersections, then the viewer is confronted with a contradiction and must assume the presence of a new optical quality. The figures are endowed with transparency, open to a new interpretation without the optical destruction of the original pieces.” This relates directly to the formulation of the Aurorium spaces which are simultaneously inhabited by the interiority of the viewer and the exteriority of the phenomenon. Rowe parallels Turrell’s ideas of “non-vicarious” space when he states that transparency “becomes a type of activation, stimulating dialogue between the form and the viewer/inhabitant.”
August Cézanne creates a duality within his paintings through the abstract portrayal of depth in landscape. With a modulation of brushwork and contrast Cézanne is able to cause the viewer to be simultaneously aware of both the depth of the landscape and of the picture plane itself. For the Aurorium, there exists an architectural blurring of interior and exterior where spaces are designed to visually draw an exterior phenomenon within the structure. The visitor to the Aurorium is aware of the structural qualities of the spaces (especially the rooftop omniscient space) while being experientially drawn out of themselves and the structure entirely to inhabit the sky with the auroral phenomenon.
Tadao Ando has developed a language of materiality that is present in all of his projects. The concrete surfaces of Ando's work react and interact with the volumes they enclose when activated by light. In Ando’s projects concrete becomes a skin that wears the colors surrounding it, a serene surface that may be warm or cool depending on its lyrical interaction with light. The ability to portray the materiality of the Aurorium spaces was critical to my project. The interaction of material, light, and color formed spaces that were tangible, and the juxtaposition of concrete, wood and steel created the canvas for the Aurorium experience.
James Corner came to Rice during the fall of 1998 and spoke about his book, “Taking Measures Across the American Landscape.” His graphic method of analyzing and portraying large-scale man-made systems inspired many of the diagrams I created for my thesis. The ability to create a diagram which conveys analytical information but also separates itself from its constituent parts to become a unique aesthetic object parallels my conception of the Aurorium which is created structurally on a scientific basis, but surpasses its origin when experience and phenomenon merge to form an entirely new space.
4. site
4.1 site analysis

The site for this project is Fairbanks, Alaska, a site to the far North where the harshness of the elements and the rapid changes of the seasons cause greater sensitivity to natural phenomena. Fairbanks lies at latitude 64 degrees north. This close to the Arctic Circle the land alternates between broad river deltas, densely forested hills, and open tundra. The temperature ranges from a summer high of 100° F. during periods of 24 hour daylight, to a winter nadir of -65° F. below zero when daylight lasts a scant three hours and the aurora inhabits the night sky.

Fairbanks is sheltered within a series of valleys opening onto a broad river basin which runs into the base of the Alaska range. It is the largest city in Interior Alaska with a population of 80,000 persons. Fairbanks is the home of the University of Alaska, the largest northern studies scientific institution in the world. Aurorium visitors could include the general Fairbanks community, educational and scientific visitors, and Alaska's tourist population visiting from all over the world throughout the year.
The Aurorium is situated at Creamer's Field, a wildlife refuge on the perimeter of Fairbanks town-proper. The site is critical for several reasons. First, it allows the Aurorium to be surrounded by uninhabited land while remaining within the Fairbanks vicinity, thus providing accessibility while minimizing the interference of ambient light. The second reason is the context of the Creamer's Field Refuge. Originally a dairy farm in the '40's, the refuge is now home to hundreds of species of birds and animals. The site within the Creamer's Field Refuge is consciously aware of seasonal and larger evolutionary cycles, which occur within the habitat. There already exists an extensive system of nature walks, which include educational kiosks, and areas designated to the study of migratory animals, especially birds. While the Aurorium does not need to add to this system, it must exist within this context of awareness.
4.2 site diagrams

This series of diagrams examine the forces operating on the Creamer's Field site in an effort to understand the context into which the Aurorium will be inserted. I have also used them to begin to compile the elements which will combine to affect the creation of the Aurorium both formally and theoretically.
4.3 cycles

The Aurorium visitors inhabit the eye of a hurricane. This storm is formed by the countless layers of patterns and cycles which are constantly in motion around us. Usually most of these patterns are invisible, but the Aurorium operates as the retina of an eye capturing exterior phenomena within the space. The cycles of the sun, the earth and their interaction weave a myriad of patterns; the orbit of the earth, the 27 day rotation period of the sun, the eleven year cycle of auroral activity, etc. These patterns are paired with cycles specific to the Aurorium's site; the seasonal angle of the sun, the migration of the Canada Goose, human activities, and even the schedule of events within the Aurorium itself. All of these cycles ebb and flow, combining and separating, each according to its personal pace. Because of the constant evolution of these variables the inhabitants of the eye will never repeat their experience. Each visit will hold new experiences as the interior of the Aurorium transforms within an hour or over the course of a year.

In the Cycle Diagram the standard calendar is stretched and compressed by the different temporal scales of these inserted events.
5. process
5.1 ascension

_**as-cen-sion:**_ 1. the act or process of moving upward. 2. to come to occupy for the purposes of this exploration, ascension is defined as: to be raised to a higher level, passing through a series of events, elevations or activities to reach a goal, a gradual attainment of understanding or sensual experience.

The goal for the Aurorium is to offer its visitors an historical, mechanical, and sensual grasp of the Aurora Borealis in a fashion unique to Alaska and to the aurora. It is critical that the spaces of the Aurorium be derived not formally or programmatically, but experientially. The following diagrams explore possibilities for the spatial modulation of the auroral experience. The exploration begins with an understanding of the visual relationship between earth and sky bounded by the threshold of the horizon.

Comprehension of the aurora can not simply be obtained on a mechanical / scientific level. It must include the science aspect of the experience intertwined with the cultural mythology and a metaphysical appreciation of the sheer extravagant beauty of this natural phenomenon, which far outstrips any human endeavor.

The degrees or stages represented in the four diagrams cumulatively portray the aurorium experience. They may have a distinct vertical order (hence ascension), but they could be presented programmatically in other directions, or separately. These diagrams could represent a series of spaces through which the visitor passes along a choreographed route, or they could represent one space, which changes while the visitor remains stationary.

The visitor understands his/her position in context through an understanding of the relationships:

The process begins with a realization of earth, in order to ground and enclose the visitor. Through the process of ascension there is a raising of the level of understanding and experience, and a visual, elevational rise vertically to meet the aurora.
ascension .1 representation

Within the *ascension* sequence, this is the first stage of understanding. A space of representation provokes a more linear, rapid experience without direct interaction. An informational base facilitates the visitor’s ability to fully understand the aurora when they do encounter the phenomenon. This will not only include scientific information, but also all manner of synthesized experience from sculpture in glass and music inspired by the aurora, to three dimensional projections of the phenomenon; an experience of objects and effects. As there is no necessary direct visual connection needed for representation, the human figure is shown enclosed, below the ground plane.
These spaces present a partial or modulated view of the actual phenomenon. From diffracted impressions of color to small, framed views or periscopes, this collection of more personal spaces expands the visitor's understanding of the potential of the aurora. They help to build curiosity and anticipation. The pace falters as interest moves from one modulation to another and the serendipity of new personal discovery impinges on the speed of progression. At this point the figure is represented diagrammatically within or just below the horizon, but with a fragmented connection through the ground plane.
In this space which may be considered subsidiary to the aperture heading, the visitor is presented with a compressed frontal view. This large framed view juxtaposes the relationship of the earth, horizon, and the heavens and further situates the viewer within this relationship. Presented in panorama the view functions as a diagram of this relationship, revealing the auroral phenomenon in the context of landscape. This is a space of contemplation and waiting. The pace slows and programs could include lounges or a café where people could wait for the appearance of the phenomenon. Within the panoramic space the figure continues to inhabit the horizon, but with an expanded view of the phenomenon.
ascension .4 omniscient

The visitor climbs the last step to the level of the darkened platform. The dance of the aurora above and below on the reflective floor sweeps the visitor into the maelstrom. The ground drops away and he/she visually lifts into the sky, joining the dance. This is the pinnacle of the spatial sensual experience. A space which instills rapture. The visitor is lost in the experience. At the opposing end of experience from the simulated informational understanding, this experience is primal and much more powerful. At this final stage of the ascension experience the figure is lifted above the horizon to join the phenomenon within the zone of the sky.
ascension diagram

**connection** - This diagram explores the multiple connections which would be spatially possible within the aurorium. The event path is bent into a cycle. The perimeter circle represents the ground plane and each shape an event.

**compression** - This smaller diagram duplicated the relationships of the prior diagram but within a constricted space. The events begin to overlap and combine to form new hybrid experiences.

**progression** - This diagram further explores the relationship of each event to the ground plane and examines the nature of the ancillary spaces between each event.
5.2 scenarios

These fictional experiences were used as the next stage following the creation of the diagrams. The progression of experiences in ASCENSION seemed to provoke three different spatial possibilities. These narratives were written as a design mechanism for brainstorming, allowing me to maintain the flexibility of dealing with events, sensations and experiences without defining plan or section etc. By writing several of these scenarios I provide a more diverse pool from which I later drew in the design process.

Scenario 1 Spatial pathway, linear progression, collection of spaces
Scenario 2 Stationary movement, cyclical unfolding of a space
Scenario 3 Simple primal forms, a natural gesture
Green light bounces down the sides and rain over me merging with the sound of water.
Green light bounces down the sides and rain over me merging with the sound of water.
Friday night 10:30 PM
November 16th

I pull off College Road and drive past the Alaska Fish & Game building and the Creamer's barns. It is a clear night and the open, snow-covered fields reflect the dim light of a myriad of stars. The moon is at its nadir tonight, the perfect night to visit the Aurorium. I curve around the barns and pass into the tree-lined drive. I pass a sign requiring the extinguishing of headlights. The road remains softly lit by the undulating lines of mesh fencing on either side of the drive. Fountains in the summer, they are now covered with sheets of ice lit with a cascade of changing colors.

At first it is difficult to distinguish the darkened bulk of the building rising up out of the snow covered ground. Parking is separated from the building by a wall. I get out, passing through the wall to the entrance path, following the lines of low lights to the building entrance. A cut in the side of the building reveals a glass slot, like a vein of quartz in a face of stone.

I enter the lobby and look down the length of a long gallery. The shapes of people shift and merge, seen only as colored silhouettes projected on layers of translucent glass. The overall effect is one of waves of color constantly ebbing and flowing, merging in one instant only to disperse in the next. I descend the stairs, wrapping about a sculpture of woven beaded threads draped and cascading over cylinders of glass toward the gallery floor below. It sways softly in errant currents of air, creating a low chiming sound audible only to those nearby. The gallery is comfortably filled with people wandering between installations and artistic representations explaining the mysteries of the aurora. At the opposite end of the long hall the light is dimmed perceptibly and I notice a low ramp curving upward out of view. Drawn toward it, I pause momentarily at the partially open door of the small theater. I hear the strains of energetic flowing music, which I can see in my mind's eye, paired with projections of dancing aurora.

Mounting the ramp curving slowly upward, I notice a green tint cast across the even surface at my feet. My eyes are drawn upward to a deep aperture set high in the wall through which I can barely glimpse a vibrant tenderl or green fire on a black background. Quickening my pace, anticipating what must come I continue around the curve and am presented with a series of darkened openings. Do they all lead to the same place? I mentally flip a coin and enter one the openings. The light in the room is almost imperceptible, but somehow I sense I am alone. As I wait for my eyes to adjust, I hear the sound of flowing water and finally I make out a square set into the floor at the center of the room. The sound is coming from the square shape, which
is actually a slot cut into the floor. I cross into the square and suddenly find myself at the bottom of a deep well looking up a vertical passage to the sky far above. Green light bounces down the sides and rains over me, merging with the sound of the water. As I watch, ripples of red streak over the mouth of the well, passing in front of my distant viewport and quickly vanishing, leaving me in darkness. I breathe a sigh, only then realizing that I had been holding my breath.

There is another dimly lit door at the far side of the room opposite where I entered. Had it always been there? Passing through the shrouded opening, space expands and opens before me. I realize that what I first took to be a photographic mural stretching the length of the huge, low room is in fact a seamless swath of glass providing a ribbonlike view of the snow covered fields to the darkened hills beyond, dotted with tiny lights like stars, and above, the expanse of the night sky streaked with a single rivulet of green light. The strand of aurora stretched away to the horizon seeming to brush the tips of the hills. As I move closer to the window the aurora moves toward me, writhing and dancing like a living thing trying to escape from an unbreakable grasp. Suddenly, the light is freed from its confinement and subtly undulates, sketching a shallow sine curve. Caught up in tracing the apparition, I fail to notice the first tendrils of light as they begin to coalesce in the night sky. This time the dance is even more frantic than the first time, causing the ribbon to fracture and spiral before passing out of the range of the windows peripheral vision. The room lights raise and dim, calling the audience to make their journey to the last stage of the Aurorium experience.

Continuing our path through the rooms, we take the ramp that runs along the back of the panoramic space. Again climbing, I pass along a bank of windows, seemingly a continuation of the previous ribbon. The ramp becomes a bridge and I am surprised by the height to which I have climbed as I penetrate through the lobby gallery high above the floor filled with people. I can almost feel myself being drawn up, completely separate from my self-propelled forward motion. The bridge ramp becomes a tunnel whose mouth opens within the area of an expansive platform. I feel as if I am surfing as my head peaks over the lip and I step out onto the dark reflective surface covering the platform. The means of enclosure is ambiguous, as if I had climbed onto the roof of the building. I hear an intake of breath and look up to see the sky again give birth to the dance of lights. As the aurora swoops overhead, it is mirrored in the floor and I feel as if I have climbed Mount Olympus and I am within the aurora itself, swept off the ground, high in the sky. The world spins disorientingly. It is unlike anything I have ever experienced.
Knowing that I had a long week of hard meetings still ahead of me, I decide to go in early this morning to stop at the Aurorium and give myself a respite of solitary introspection before the wave of the day crested over me. I had been to the Aurorium many times, but I never fail to notice something I had not seen previously and to depart with a renewed feeling of equilibrium.

I turn into the Creamer’s drive and passed the old barns. The morning sunrise still hours away, the darkness closes in as I leave the field clearing and switch off my headlights, directing the car toward the first pair of pylons in the distance. The rods projecting from the snow covered ground are fabricated from fractured glass planes and lit with different colors from within. They form an aisle of varying density throwing streaks of color across the surrounding white surface. I pull into the small lot facing the distant orange glow of the city and turning my back to the light I head toward the darkened berm of the Aurorium structure. The only light comes from a set of stairs cut into the back of the hill. I pass the stairs and work my way down around the side of the incline and enter the ramp leading below the surface. The ramp becomes a tunnel that turns into the side of the hill, ending in a strip of glass doors. The subsequent space is backed by a softly undulating wall cut with a series of seemingly random apertures which seem to shift as I move toward them. I pass through the doors and become aware of a subtle projection of color that plays across the surface of the wall like the ebb and flow of waves lapping against a shore. I can now see over the wall and into the huge interior volume, a space created by what seems to be a horizontal plane which has somehow shattered and fallen, piling itself up haphazardly on the ground leaving a space both united and fragmented. The end of the wall is lined with a series of vertical prisms which lit from behind in sequence casts a splash of colors across me and the opposing wall, seeming to create a semi transparent membrane of color, an airlock giving access to the space beyond.

Today I am the only visitor and the feeling of solitude is palpable in the silent air, like the lull before the storm. I pass around the wall and enter the cavern just as the lights dim, further stilling an already silent space. In the darkened atmosphere a vertical shaft of green light slices through the shadows to spill across the floor. The flickering energy draws me toward it and as I approach I realize that it is not a projection, but a thin vertical slot, making it appear as if the wall has fractured and separated slightly. The narrow aperture works like a diffraction grating causing light to spray across the interior of the cavern. I stop to enjoy the view, knowing that while other fragments of the space cycle through every twenty three hours with the
visit I was startled by the approaching event, but this time I am ready, waiting with anticipation for this moment, for the experience that never ceases to invigorate and enthrall me. As I watch and wait, the dark enclosure of the ceiling, so far enshrouded with darkness, begins to fold and retract, stripping away the thin veneer of materiality that had separated me from the beckoning lights. Concentrating as I am on the motion of the roof planes, I fail to notice as the dais rises above the cavern floor. I am drawn up through the gradually blossoming aperture. Leaving the enclosed space behind I feel mentally catapulted out into space. I join the chaotic display, riding the flowing streams of light, almost but never quite grasping the coherent intelligence that I sense in the patterns of the dance. As the energies finally disperse and the sky again returns to stillness, the platform recedes. Instead of returning to the cavern floor as the platform halts at the outer surface of the Aurorium volume, I step off and climb the hill passing other apertures as they open and close, giving me glimpses of the floor far below. Reaching the crest of the promontory the path dips below the surreal surface and I push through the glass doors exiting into the crisp morning air. Down the stairway I again join the path I had taken what seems like ages earlier and head back toward my car.
Friday March 3rd
3AM

We have friends visiting from the "lower 48". They have been with us for almost a week and will be leaving tomorrow. We had a dinner party with a group of people from the neighborhood and as the evening draws to a close we decide to make a trip out to the Aurium. The weather forecast is for increasing clouds over the weekend and this could be our friends' last chance to experience the phenomenon before they leave.

The drive takes only fifteen minutes and I pull into the softly lit lot next to the Creamer's barns. Getting out of the heated automobile we swath ourselves with layers of down and wool chuckling to see the plumes of steam escaping in our breath as the particles of moisture bond with ice in the air. We head across the empty lot toward a cleft in the berm that surrounds the parking area. The cleft is lit from some unknown source, the walls glow softly as if the tear has revealed some underground energy normally hidden by the epidermis of vegetation and snow. The crest of the berm is well above our heads and as we pass through there is a brief sensation of submersion. The slot is directed toward the northeast and as the walls climb our peripheral vision is funneled forward and the world is compressed into a vertical band. The light of the slot compared to the exaggerated blackness of the night sky makes us overtly aware of the forces bound together in the juxtaposition of earth and sky.

The path leads beyond the berm and out onto an open expanse of white before entering a wall of trees on the far side. The path is lit from below the snow, giving the surface an impression of a paper-thin skin stretched taught over an undulating volume of light. The light is subtly refracted by millions of prismatic snow crystals casting veils of color across the path. The trees part and we enter a clearing enclosing a low knoll. I had allowed our guests to precede us onto the path and I watch their faces as they come to the realization that what they had originally taken for a natural landmass is something else entirely. On further examination of the "hill" in the distance, they could make out unnaturally repetitive patterns and straight lines as if the whole mass had been some huge machine that had crashed and been slowly consumed by the environment which over time has haphazardly blurred and buried the signs of human intervention. The path branches, one fork heading around the base of the knoll and out of sight, and one tracing a line up the other side of the fractured incline. We mount the first series of stairs which seem to be cut into a face of ice until we come to a landing where the path again diverges, plunging into the side of the knoll or continuing to climb, spiraling up the slope. A storm of light is breaking on the horizon and we continue up the path as the first wisps of
orientation. A flow of water cuts down a slot in the wall and across the floor as if a subterranean stream has been collected and redirected through the interior of the knoll. The sound of running water reverberates off the walls and ceiling of the tunnel, but slowly I can make out strains of music as if carried on a breeze from some far away place. The light again dims as the music gets louder until the tunnel gallery spills out into a huge cavern at the very heart of the knoll structure. Again there is the feeling of a giant machine being slowly consumed by nature. Arching over the cavern is a slowly rotating projection of the night sky. Watching the simulated constellations we notice that some of the stars remain stationary. As I struggle to recognize some stellar pattern in these errant stars, the projection fades and shafts of light stab through the ceiling to overlay transparent pools of color across the floor. The prismatic apertures that I had noticed channel sunlight into the cavern during the day, but now they modulate light from some hidden sources within the knoll structure. Passing through the islands of color and shadow, the sweeping cadences of a waltz provokes images of dancing with the ribbons of aurora. My heart races as I spin laughing across the floor. Voices scatter around me calling to each other as I see them appear and disappear into the kaleidoscope. The colored shafts dim and the constellations again cross the interior night sky. We gather in the center all delightfully exhausted by the experiences and ready of follow the final gallery out to the surface. We trudge back to the car in companionable silence, each of us bent on some internal reliving of our experience. We return home to our beds and spend the remainder of the night in deep sleep, dreaming of dancing among the stars.
5.3 narrative model series

After the creation of the three possible Aurorium scenarios I returned to them with the intent to mine each for information or patterns which could be abstracted for the formulation of a basic operative theory of the role the Aurorium could play within the viewer/phenomenon relationship. The spatial character and mode of experience of each narrative was abstracted formally in the creation of a spatial diagram. Based on the premise of the ambiguity of the auroral experience and the possibilities of a nonhierarchical space, a blurring of boundaries and an overlapping of spatial volumes and programs may occur. Utilizing Colin Rowe's theory of spatial transparency and simultaneity, the sequence of spaces for each narrative was compressed into a constrained space such that the narrative events folded back on themselves and overlaid upon one another.

Each of the models was given a title or label derived from analysis of its narrative, which helped to drive the formal decision making process.

1. Sequence: path
2. Cycle: schedule
3. Vertical: epidermis

Using these basic titles, I laid out the story line of each narrative. A set of guidelines was established including the base size, grids oriented to true north and magnetic north, materiality to emphasize character, and a lack of thickness and vertical height. These allowed me to concentrate on the narratives and their respective characters.
Following are words or concepts used diagrams, which endeavor to grasp narrative space separate from the a

1.

natural forms
spatial sequence, procession
awareness of position
surprise and anticipation
evolution
public and private spaces
experience
verticality
Ascension

2.

vertical and horizontal cycles
time
folding and unfolding
number of people
ephemerality
6. design
6.2 procession

As the path within the aurorium is critical to the experience of the phenomenon so too is the approach. To fully experience the event of the aurora borealis the visitor must relinquish the urban context of their daily lives and open their senses to a different and separate existence. The approach procession utilizes the Creamer's Field Barns as a threshold beyond which lies the zone of the Aurorium. The Barns are lit at night with a caustic yellow light, a reminder of the urban context the Aurorium visitor is leaving behind. The visitor sheds their urban skin, turning their backs to the light and allowing their eyes to adjust to the darkness. The procession leads through a series of clearings and densely forested barriers. The series of thresholds directs the visitor's view and expands and compresses their peripheral vision, further distancing them from the exterior of the site. The visitors enter the final stand of trees and are awarded glimpses of the Aurorium structure before they arrive at the mouth of the passage leading into the building. Upon exiting a reversal of the progression takes place as the harsh light of the Barns is framed by the sequence of barriers, and the visitor reclaims their urban context.
6.3 path sequence

SKY transparency

HORIZON epidermis

EARTH infrastructure
6.4 interface
6.5 narrative

stacked landscapes

Because the Aurorium is a public and educational space, not a scientific one, the nature and placement of the structure must balance considerations of accessibility and reduction of light pollution. The aurora appears only intermittently during the night hours from late fall to early spring. The design of the Aurorium must be developed such that the building may function during the hours when the auroral phenomenon is not present. This will require spaces which both frame and reproduce the experience of the auroral phenomenon e.g., “spatially, or visually, etc.”. As the architect I have designed a path which leads the visitor through the various stages of experience, beginning with the representation spaces and culminating with the omniscient space. This procession is woven into the structure of the building. Because of the constant evolution of the many cycles overlaid across the site allow visitors to return repeatedly, the spaces have been closely connected causing multiple possible paths between events and the circumvention of the set procession. Each space has its own pace and personal connection to the phenomenon. The visitor penetrates the structure below ground. As they emerge into the interior they are situated spatially by a huge skylight which acts as the pivot point for circulation throughout the building. Materials are utilized as informational datum throughout the building. Between interior spaces and interior/ exterior a wooden collar is inserted, a threshold of warm materiality which offsets both the monolithic nature of the concrete surfaces throughout the building and the metal and glass of the apertures. The visitor crosses the wooden threshold and enters the gallery which holds the auditorium and the audio visual recreations of the aurora. This space is buried below-grade as the activities of representation do not demand the direct connection to the phenomena. The visitor then passes through a series of private and public spaces which modulate interaction with the aurora including small skylit spaces, expansive translucent spaces, and long panoramas. The visit culminates as the visitor climbs a long ramp
which surfaces into an open space on the roof. The *omniscient* space is enclosed by a glass and tensile steel structure floored with a concave surface of highly polished concrete. The aurorium structure is left behind as the aurora sweeps through and pulls the unwary into its cosmic dance.
key

01 entrance tunnel / skylight
02 gallery entrance
03 gallery
04 auditorium
05 skylight space 1
06 skylight space 2
07 ramp
08 front apertures
09 panorama space
10 ramp to sky space
11 sky space
12 sky space / skylight
6.6 design drawings

**Viewing Apparatus**

While the narrative renderings represent the progression of sensual experience within the stacked landscapes, the building maintains its duality of experience and understanding. The second half of this duality is portrayed by the design drawing series. By its nature the computer drafted image is part of a more scientific materiality. While the visitor to the Aurorium may be enthralled with the visual affects of the Aurorium, they will be conscious on some level of the underlying structural geometries which work to emphasize the experience. They may not recognize that the building is tilted 5° to the north aligning with the natural inclination of the aurora, or that the interior slope matches the true north direction of the aurora and the 11° slope between the horizon and the bottom edge of the aurora which is specific to the latitude of Fairbanks. These scientific elements aid in the choreography of the spaces. It is not necessary to make them literal or obvious to the visitor, they simply add to the mystery of the dialogue between the phenomenon and the building.
roof plan
6.7 light

The Aurorium as an eye not only captures the colors and sensations of the aurora during hours of darkness, it will also function in the same capacity for the unique effects produced by the sun in Alaska’s northern latitudes. Alaskan sunlight ranges greatly from the summer months when the sun just dips below the horizon and a golden evening glow lasts for hours, to the long winter months when the sun remains submerged for most of the day and only delivers a sharp cool light which cuts across the landscape. During the daylight hours the aurorium apertures frame not only the sky, but also the natural landscape of Creamer’s Field. Joining the other cycles woven through the aurorium experience, the duration of daylight in Fairbanks varies more than an hour within one week causing a constant metamorphosis of the colors, textures and spatial character within the structure. The collection of skylights and apertures fill the interior with each emerging light. Thus the aurorium will function as a sensual space throughout the year.
winter light

2:00 pm tuesday

January 5th
7. models
8. bibliography and images
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**Materiality:**

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