IPRO 303

Designing an Exhibit for Fermilab’s Atrium
Introduction: What is Fermilab?

- Home of high energy physics.
- 6800 acre site, world’s most powerful accelerator.
- Gain knowledge of nature at all scales.
Introduction: What is the ILC?

• International Linear Collider
• ~20 miles long, multibillion dollar
• Next generation of technology, will become most powerful in the world
Introduction: **The Future**

- DOE/NSF support building the ILC in the US
- “...take steps to remain a world leader...”
- “…highest priority of the U.S. program…”
- Fermilab likely host institution
Introduction: **The Challenge**

- Events being planned for leaders to take place at Fermi.
- Develop an installation to host such gatherings.
- An art exhibit conveying the science taking place at Fermi.
- Appealing to scientific, and lay audiences alike.
- Convey scale, and importance of the work taking place.
Introduction: **Wilson Hall**
Introduction: Wilson Hall Atrium
Introduction: **Teamwork**

- Interdisciplinary
  - Architecture
  - Engineering
  - Political Science
  - Physics
- Leadership
- Dynamic Subteam Structure
- Ability to generate research and proposals
Introduction: Research
Introduction: Research
Confluence: Introduction

• Themes: Duality, Opposites, Annihilation

• Goal: Make visible the collision and annihilation that is the heart of the physics at Fermilab.
Confluence: **Design**

- Implementation: A tube filled with rheoscopic fluid, stirred in opposite directions at the ends, whose currents cancel in the center.
- Designed to symbolize the collision of matter and antimatter in the colliders at Fermi with the annihilation of oppositely rotating currents.
Confluence: **Fly-Through**
Confluence: Implementations

• Numerous designs available

• Immensely scaleable design
Confluence: Implementations

- Implementation: Multiple tubes arranged in a passage.

- Collision symbol brought to human scale in an intimate enclosed environment.
Confluence: Implementations
Confluence: Implementations
Confluence: Implementations
Confluence: Implementations
Confluence: Implementations
Confluence: Implementations
Interstitium

A space between things or parts, especially a space between things closely set...

To stand still in the middle of something...

The matrix or supporting tissue of an organ.
Interstitium: **Goals**

- Visible Detection: *at what scale*
- Visible Scale: *20 miles, linearly*
- Network of reflecting/bouncing lines
- Ability to trace any point’s path back to an origin
Interstitium: Abstract Model
Interstitium: **Wave Changing Fiber**

- Similar to fiber optics, but there is no need for a specific light source
- Multi-colored light emitted and ends glow
- Responsive to UV light, so usage of blacklights are considered for an additional dynamic to the installation
Interstitium: **Wave Changing Fiber**

- Applications to science
- Usage in particle physics and accelerators already
Interstitium: **Connection Details**
Interstitium: Mock Up
Interstitium: Mock Up, Close
Interstitium: **Up Into the Atrium**
Interstitium: **Down Into the Atrium**
Interstitium: Night View
The Visible Collision: **Motivation**

- Particle science is invisible to the human eye
- But the impact of science this small is huge
The Visible Collision: **Questions**

- Why collisions?
- How do you create an exhibit that expresses this idea?
The Visible Collision: **Film**

- Everyday objects collide at a human scale
- Plan for filming set
- Prototype film shoot
The Visible Collision: **Kiosks**
The Visible Collision: **Users**

- Interface
- Response
The Visible Collision: Interaction
Challenges Overcome

- Very few design restrictions
- Physically modeling the atrium space
- Sticking to the project goals
- New Venture into Art
Future Work

• Meet with Fermilab team to pitch design ideas

• Write proposals to fund the installation

• Consult on the installation project
Thank You

- Confluence
- Insterstitium
- The Visible Collision