Fulldome …and beyond!

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IMPA

Outline

- Omnidirectional Video Production
  - Augmented 360 Panoramas
- Immersive Interactive Visualization
  - IMPA's Dome

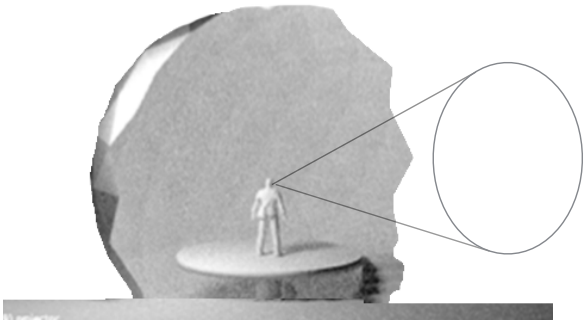
Applications to 360 Cinema

Film Language

- Conventional Cinema
  - HD Television
  - Theater Panavision
- 360 Degrees Dome
  - Omnimax
  - Dome Master

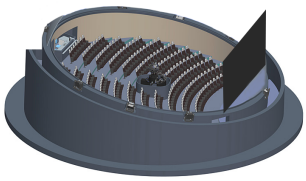
Field of View

- Reference to Observer
  - 30 to 90 degrees

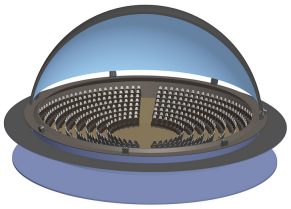


Exhibition

- Viewing Scenarios



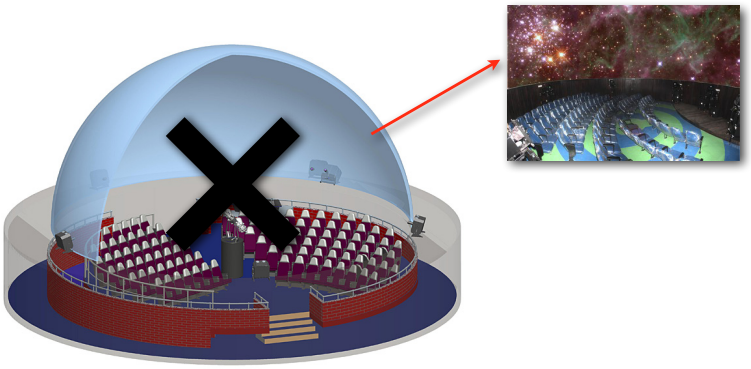
conventional theater



full dome

More than Meets the Eye

- *Beyond Full Dome Theater!*



- Active / Dynamic / Reconfigurable ..

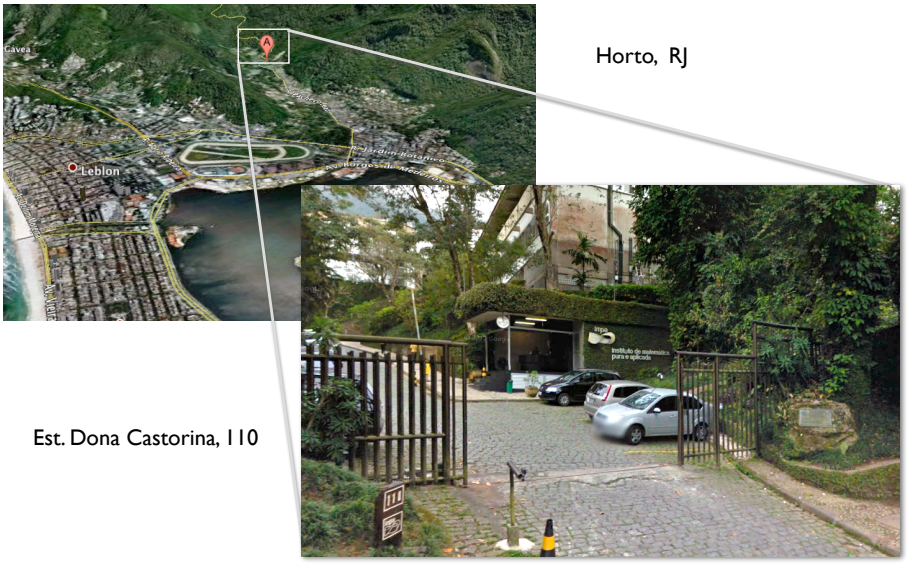
IMPA's Dome

Immersive Visualization of Spherical
Interactive Panoramic Content for Augmented Reality

- Experimental 360° Playground
- Complete I/O Setup
- Real-Time Rendering

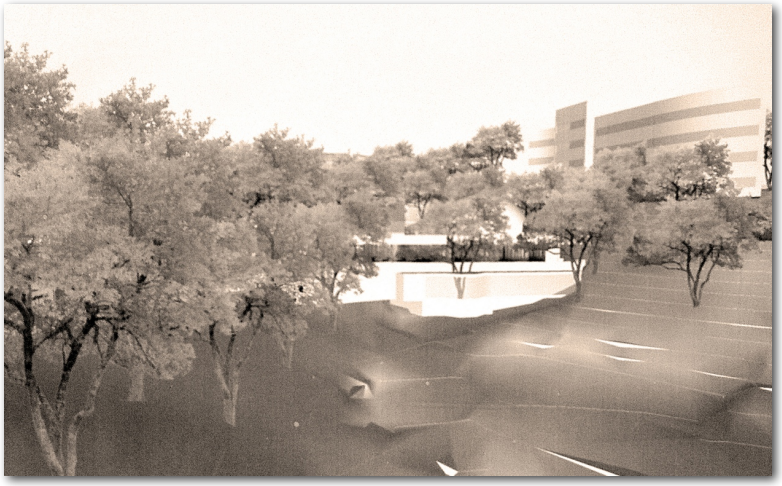
★ Planned for 2014

Location

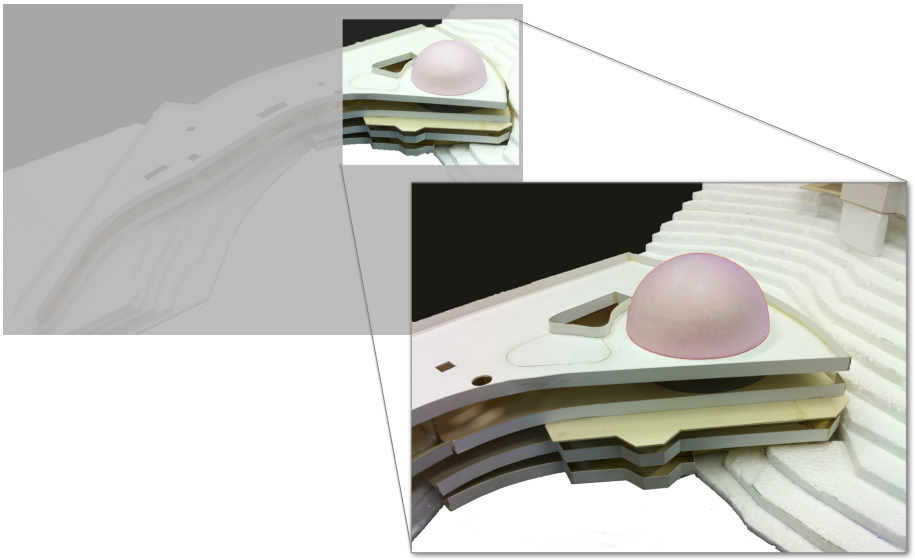


Environmemt

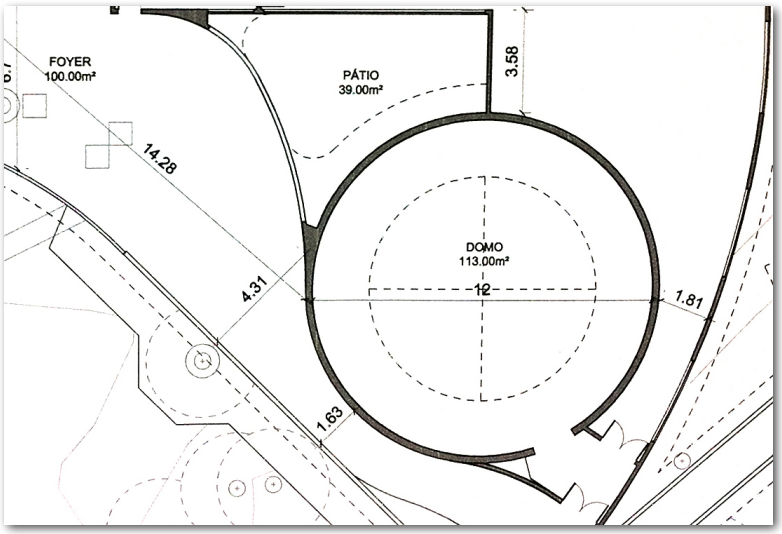
- Integrated with IMPA's building and Nature



Mockup



Floor Plan

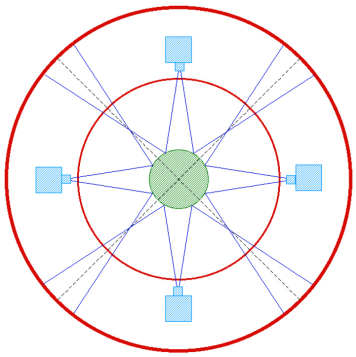


Specifications

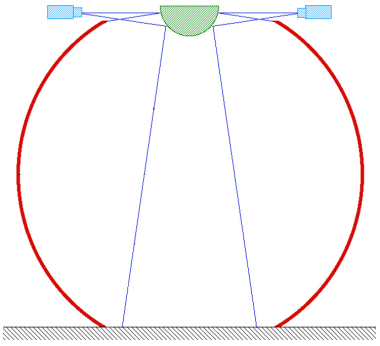
- Size: 8 meters diameter
- Projection: 360° × 140°
- Sound: 7.2 Surround
- Reconfigurable Viewing Space
- Tracking: Head and Full Body
- Depth Cameras: RGBD

Projection

- Hemispherical Mirror + 4 Projectors



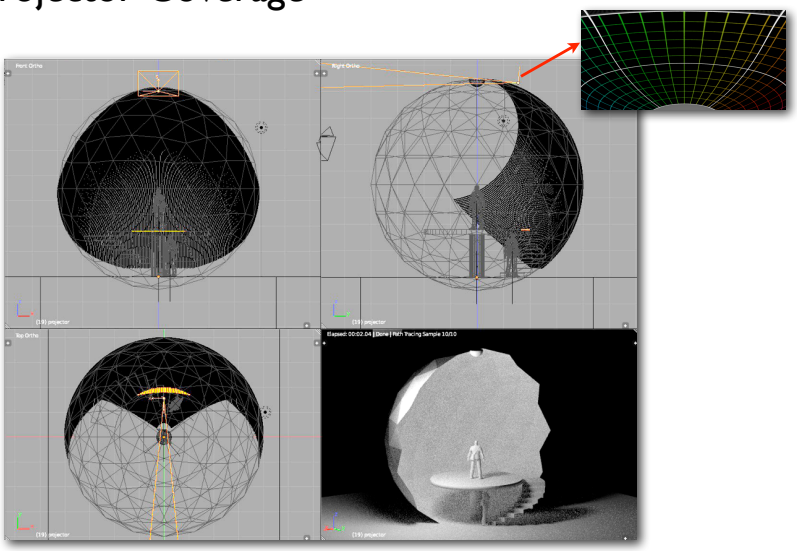
top view



side view

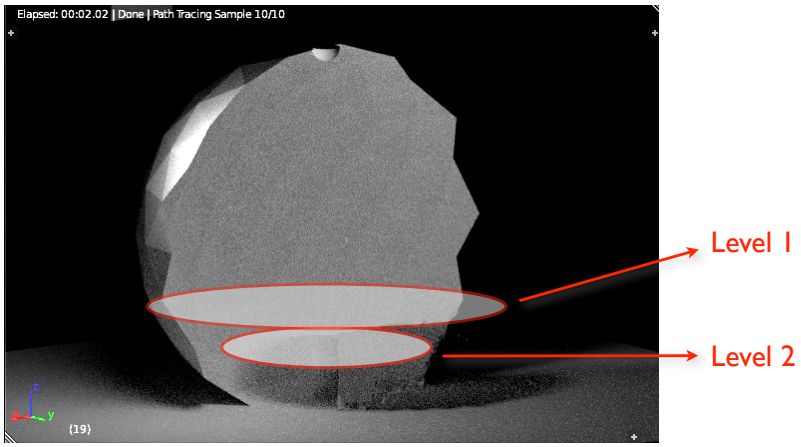
Simulation

- Projector Coverage



Reconfigurable Floor

- Two-Level Base



Level 2 - FOV

- Center View (~140° Vertical Field of View)

Level 2 - FOV

- Border View

Envisioned Applications

- 360° Cinema
- Full Scale Games
- Immersive Visualization
- Parallel Reality
- Interactive Exploration

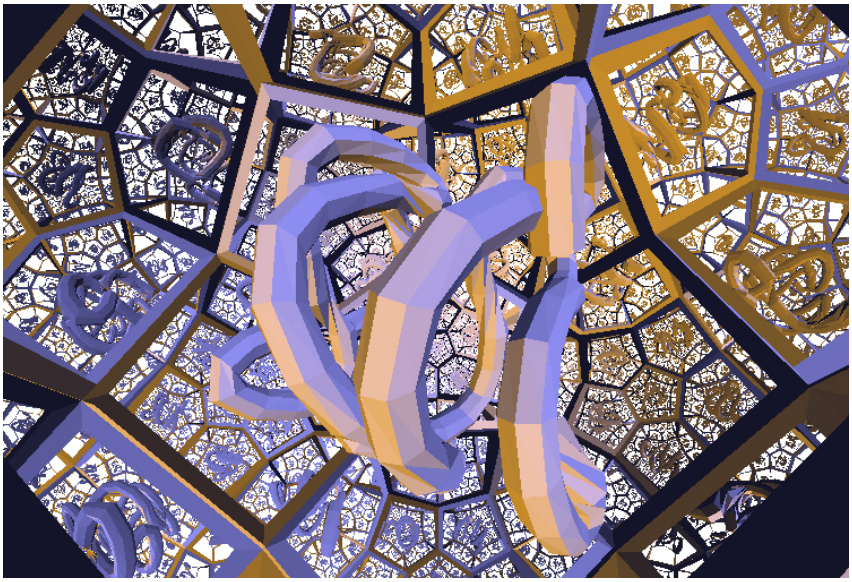
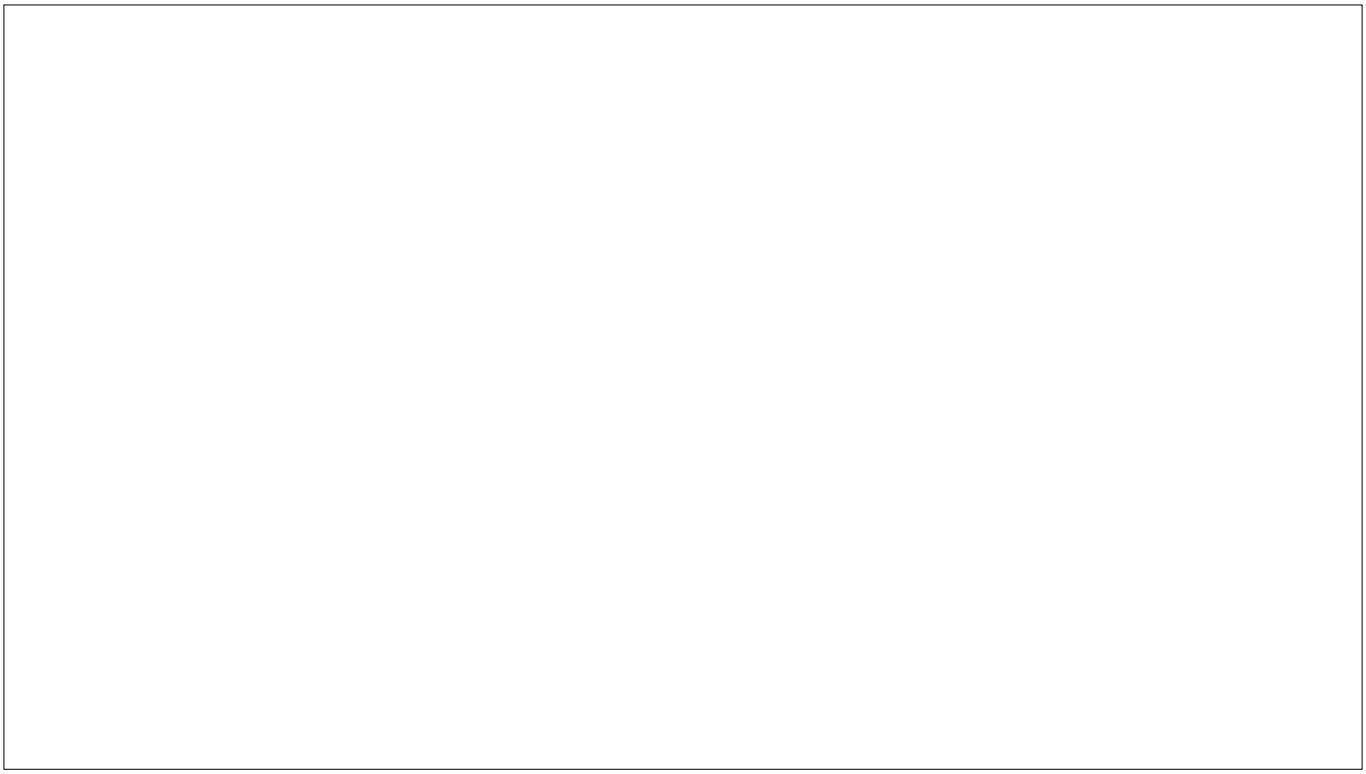
Future Research

- Authoring Systems
  - Integrated Media
  - Natural Interfaces
- Production Techniques
  - Live Action + CG
  - Real Time Simulations

Some Examples

- *Relativistic Visualization* (2007)
  - collaboration with:
    Marcelo Cicconet
- *Exploring 3D Manifolds* (2015)
  - collaboration with:
    Pierre Berger, Alex Bordignon, Sergio Krakowski
- *Ray-VR* (2019)
  - collaboration with:
    Tiago Novello, Vinicius Silva

Hyperbolic 3D Orbifold



Mirrored Dodecahedron