

デジタルドームシアターの国際的な動向と Large-scale Digital Immersive Media の可能性について

宇宙科学情報解析シンポジウム
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History of Planetarium

History of Planetarium

Eise Eisinga Planetarium

Franeker, Netherlands

1774 ~ 1781年に製作

1774年 月・惑星の会合を説明

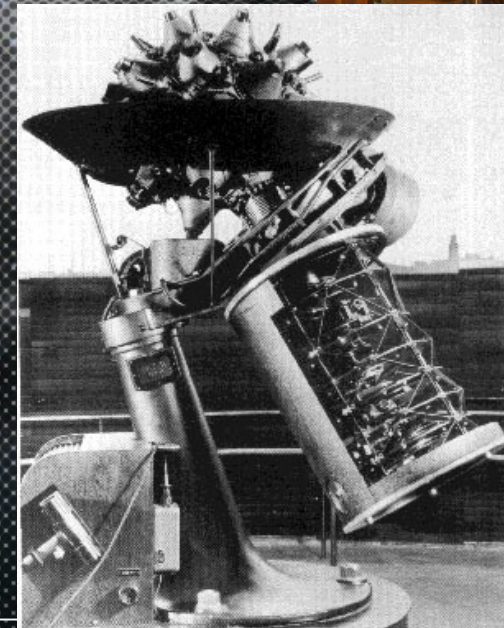


Zeiss Planetarium Projector

Deutsches Museum, Deutschland

1923年8月 Model I

月・惑星の動きを星空の中で説明



History of Planetarium

Strasenburgh Planetarium

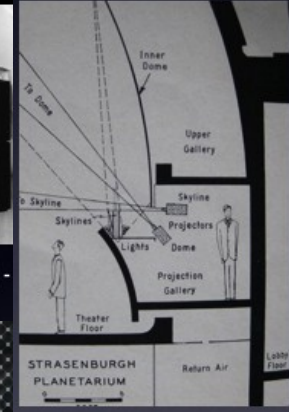
Rochester Museum & Science Center, USA

1968年9月

世界初 補助投影機を導入



PDP-8 w/ 32 K (8 4K banks) -
(on a good day)



First
projection
gallery &
cove - hard
to believe

< Note the
well-dressed
techies

Reuben H. Fleet Space Theater

Reuben H. Fleet Science Theater &
Science Center, USA

1973年 OMNIMAX

65mm Film, produced by Graphic Films



History of Planetarium

Evans & Sutherland Digistar

Evans & Sutherland

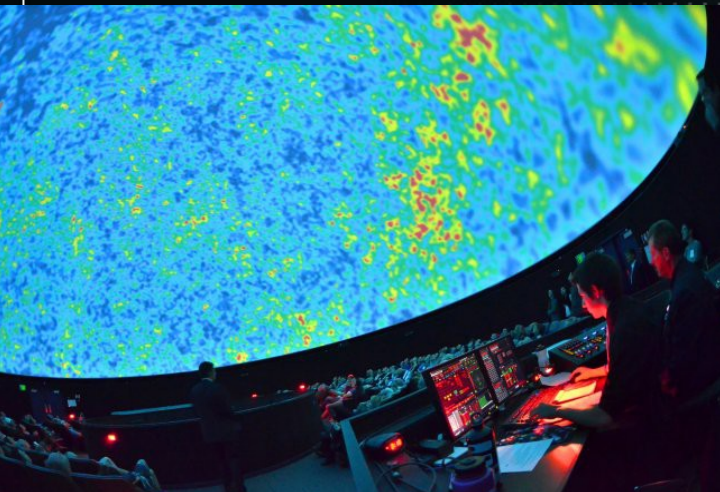
1970年代後半

Full dome video projectionの登場



Full dome systems

8K resolution, 60 frames per second and in stereo 3D



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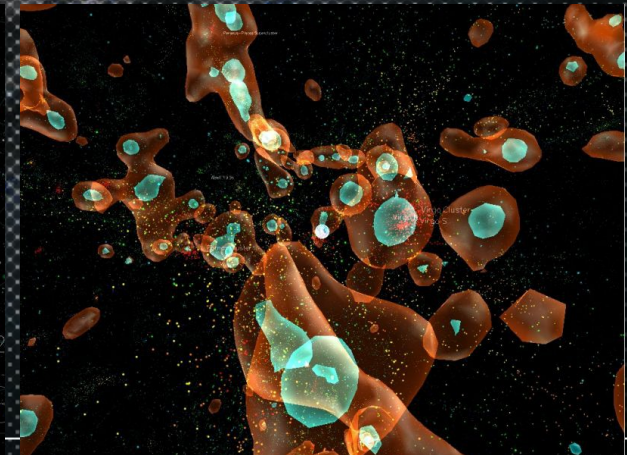
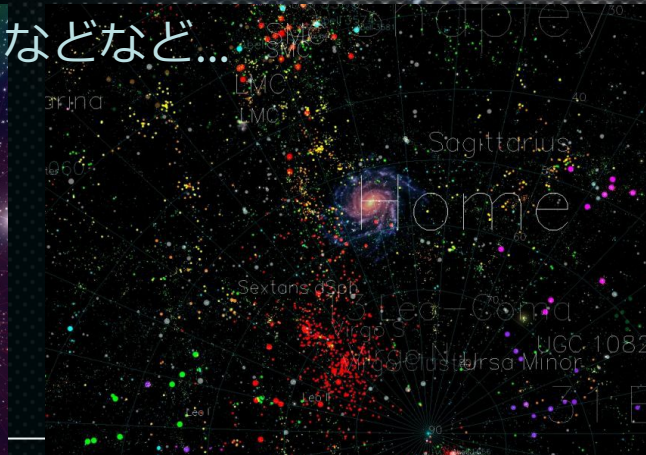
Digital Universe

American Museum of Natural History & NASA

1998年

世界最大規模の3次元宇宙モデルデータセット

- ヒッパルコス
- Tully銀河カタログ
- SDSS銀河カタログ
- SDSSクエーサーカタログ
- WMAP
- Deep Sky 画像
- 2dF銀河カタログ などなど...



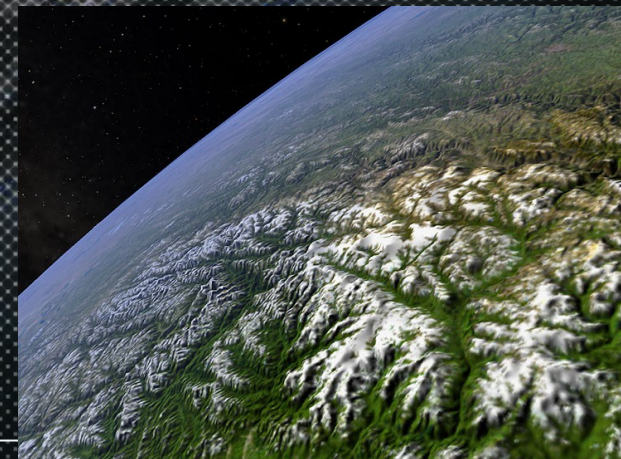
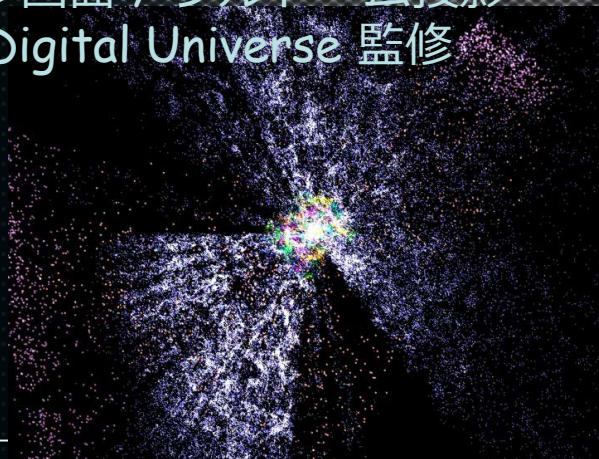
Uniview

SCISS & オリハルコンテクノロジーズ

2003年

天文可視化プラットフォーム

- 地球から宇宙の果てまでを高精度に可視化 (Scale Graph)
- スムーズなナビゲーションを実現する操作性 (Flight Assist)
- 世界最高峰の3D宇宙データベースを内包 (Digital Universe)
- 最新の地表データのストリーミング描画 (GeoScope)
- 遠隔コラボレーション機能 (Octopus)
- PCクラスタによる多画面 / フルドーム投影
- NASA / AMNH / Digital Universe 監修

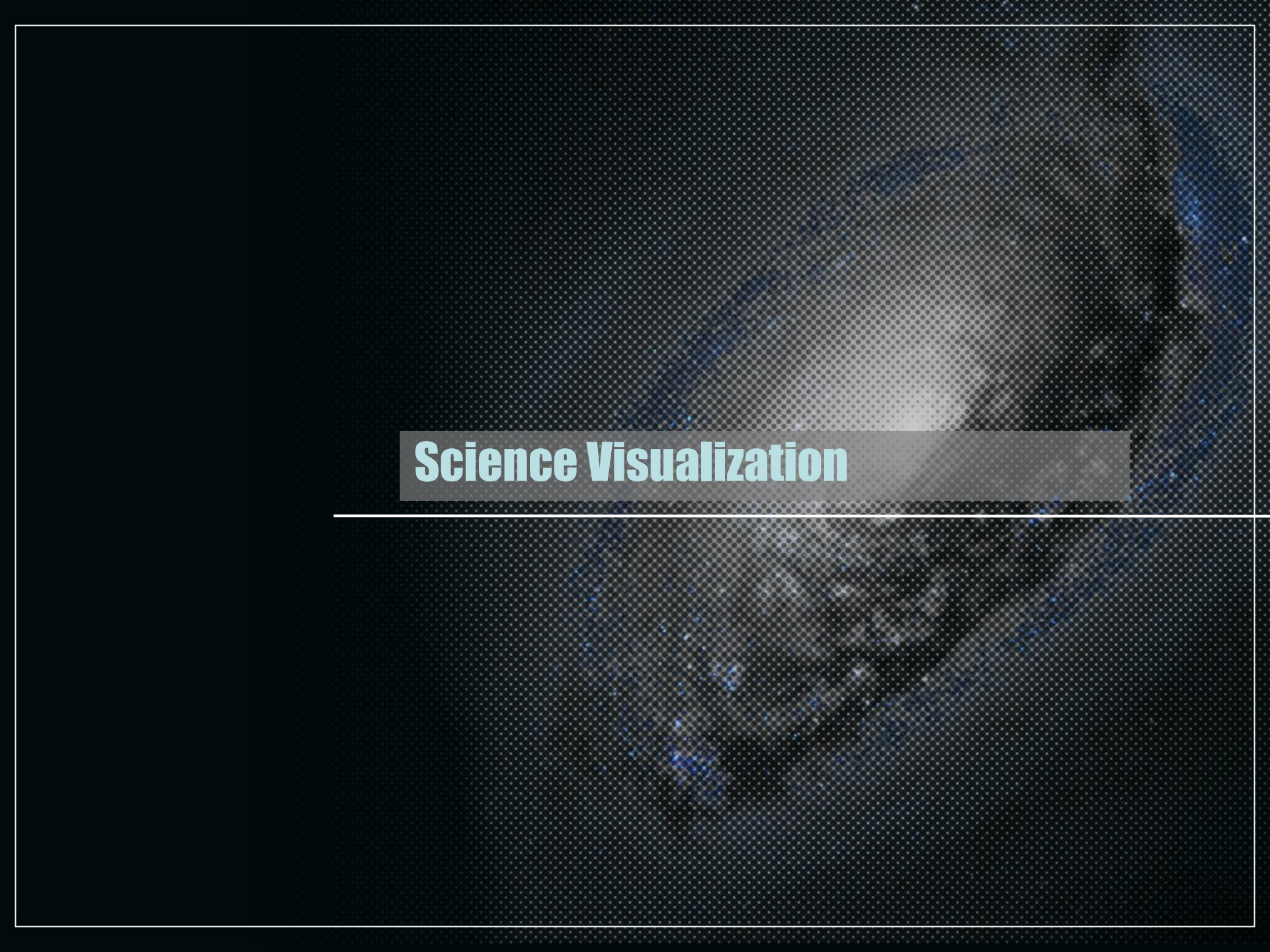


Fulldome Theater



<http://www.lochnessproductions.com/>



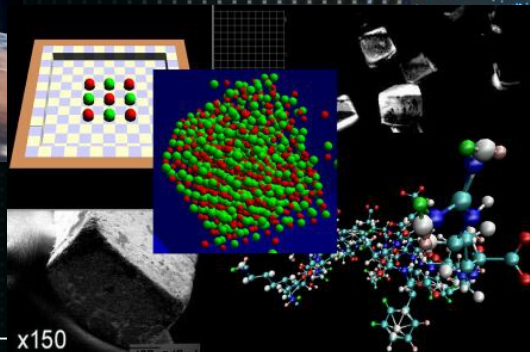


Science Visualization

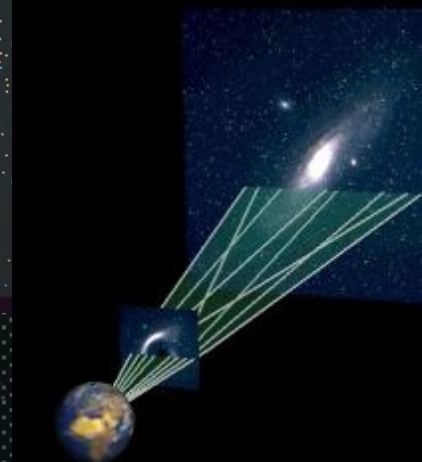
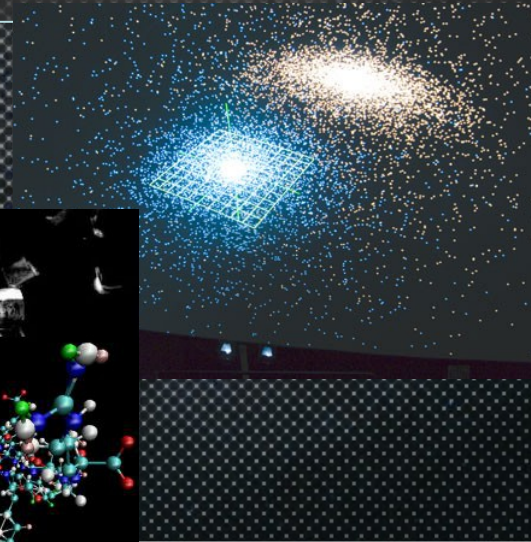
UNiVERSE SCIENTIFIC LIVE SHOW



- 1996年4月 科学技術館 Team Chimons
- 3D コンピュータグラフィックスとシミュレーション
- 重力多体問題計算専用的高速コンピュータ



x150



Space Visualization Laboratory

- 1996年4月 Adler Planetarium+U of Chicago
- Sloan Digital Sky Survey
- 可視化のプロセスと技術



3 Types Science Visualization

- [illegible]



Immersive digital experiences

Hollywood vs Academia

Hollywood

- Animation
- Tell story
- Simple physics
- Complex geometry
- Complex lighting
- Complex camera
- Heavy compositing
- Whatever looks good
- Emotional
- Right brain
- Aesthetics

Fantasy

Academia

- Simulation
- Illustrate point
- Complex physics
- Simple geometry
- Simple lighting
- Simple camera
- No compositing
- Exact / approximate
- Intellectual
- Left brain
- Accuracy

Verité

IMERSA

Immersive Media, Education, Entertainment, Research,
Science and Arts

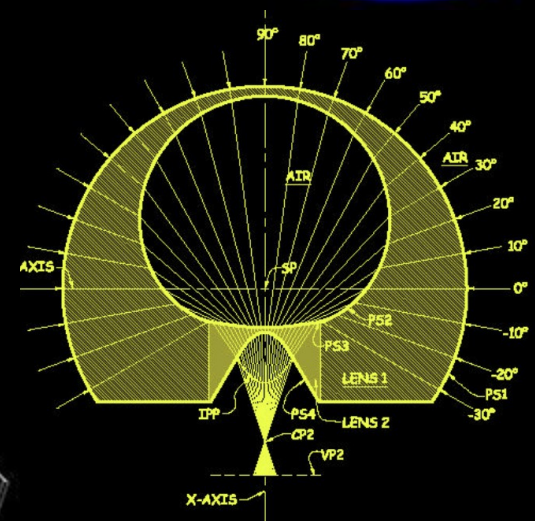
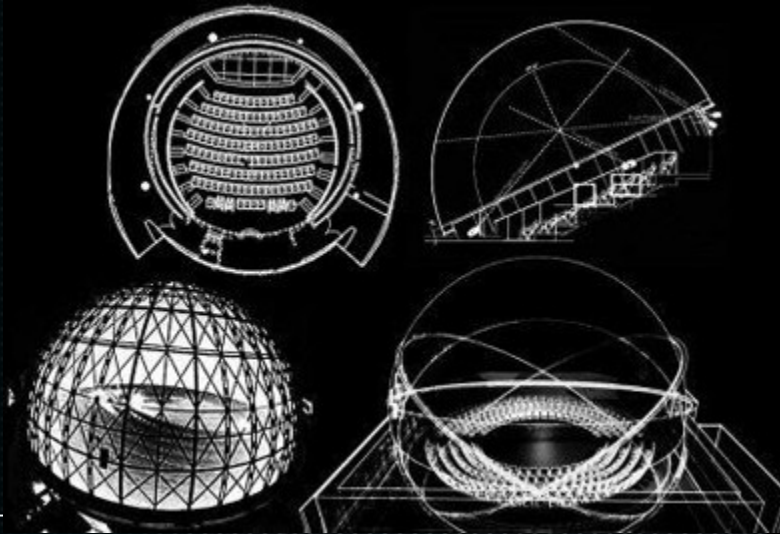
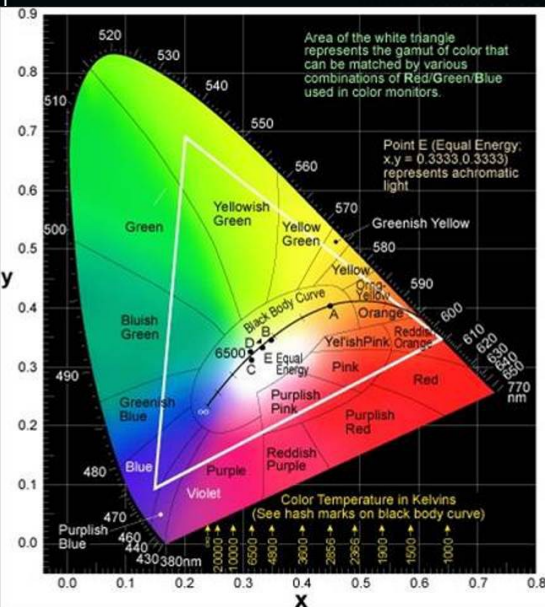
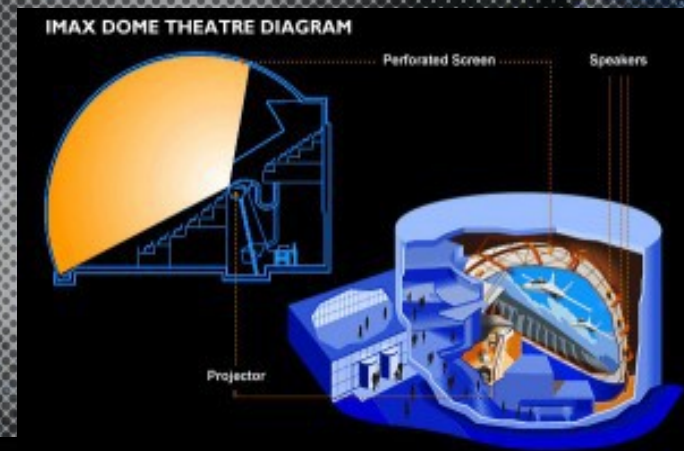
To build an international community of professionals
who create large-scale immersive digital experiences.

→ Bridge to many disciplines, including research,
art and technology



Immersive projection environments

- ✿ Art and Science of large-scale digital immersive media
- ✿ Fulldome
- ✿ Digital planetarium
- ✿ Themed entertainment and giant screen theater



3D SUN

AS CLOSE AS YOU EVER WANT TO GET

IMAX®

IMAX SCREENS vs OTHER SCREENS

IMAX screen



25m
80ft

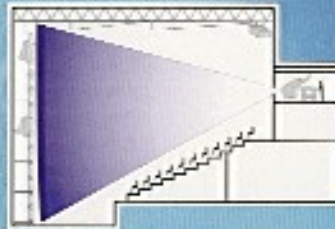
35mm screen



70mm screen



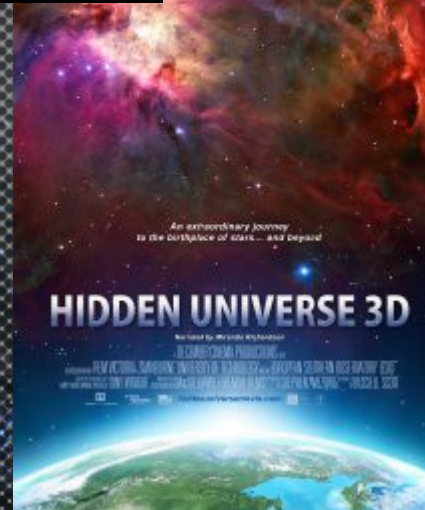
IMAX THEATRE DESIGN



Typical IMAX/IMAX 3D theatre



Typical IMAX Dome theatre



International Planetarium Society

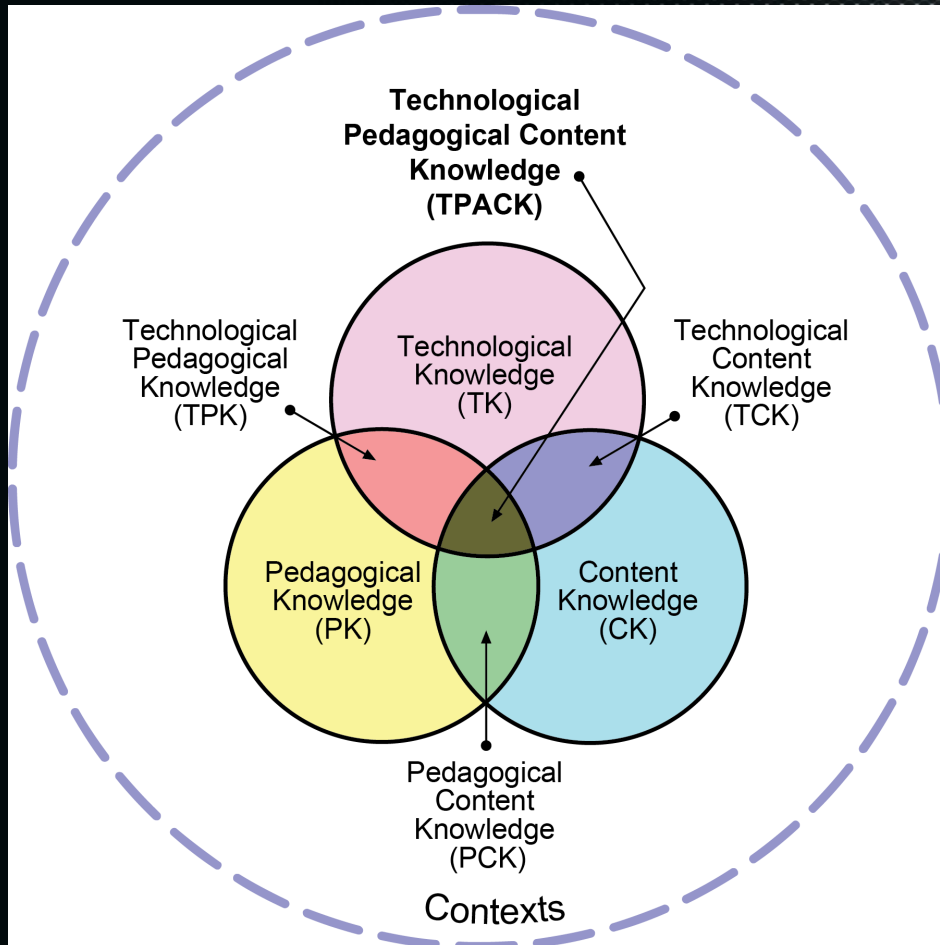


- ☼ Data to Dome
- ☼ Provide a powerful and lasting inspirational experience.
- ☼ The big data era and the nexus of science and education
- ☼ The potential for scientific communication and storytelling in the planetarium
- ☼ Standards for real-time, or near real-time, scientific content distribution: imagery, videos, tabular data etc.



Using Art to Education

Art is a powerful communicating Tool



Technological Pedagogical Content Knowledge

Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationship between these components of knowledge situated in unique contexts.

