

Okanagan Immersarium Circle

May 14, 2004

Executive Summary

I hereby propose the creation of the Okanagan Immersarium: a domed Digital Theatre. More than a showpiece crowning new campus construction, the Immersarium supports at once fundamental, interdisciplinary and eclectic research within both the Faculty of Arts and the Faculty of Sciences at UBC-O. In addition, it serves both local Industrial and the Educational sectors.

Key Points

By its strategic presence, the Immersarium

- serves as an architectural "prime focus" of the new UBC-O campus
- declares UBC-O's commitment to constructing state of the art facilities
- provides a signature meeting facility for community venues (e.g. hi tech)
- reinforces K-12 teaching with a unique and memorable educational experience
- augments the campus with facilities not widely available elsewhere
- encourages collaborative and interdisciplinary research within academia
- forges liaisons between UBC-O with high-tech industry (media and IT sectors)

By its multi-functional use, the Immersarium supports

- current research in the Department of Computer Graphics, including
 - Scientific Visualization
 - Virtual and Augmented Reality
 - Advanced Interactive Display Technology
 - Emerging Sociology of Human/Computer Interaction
- future needs of an Engineering faculty, through
 - Engineering Visualization
 - Modeling and Simulation
- educational needs in the Department of Physics thorough
 - Real-time Planetarium
 - Studies of kinematics and gravitation
 - Possible addition of adjoining (digital) observing platform
- societies and other local organizations
 - Royal Astronomical Society of Canada
 - OSTEC
- many active University Circles, especially the
 - **Archive (Modern) Circle** [Dill]

A modern archive needs modern means of exhibit display. The system ed by Drs. Paeth and Dill (1995) was among the world's first interactive

digital archives. A recapitulation of this strong synergy takes ready advantage of the large display

- **Computer Science Circle** [Gee]

Expertise by two faculty members (Lassarre, Paeth) in Image Processing and Computer Graphics, respectively make this a natural fit. Both share research interests in human/computer interaction; both have a strong commitment to the local community.

- **Distributed Learning Circle** [Kjarsgaard]

The multi-use theatre maximizes Telepresence, making it an ideal venue.

- **Graduate Studies Circle** [Walker]

At the latest Faculty of Science meeting Ian Walker elaborated on point (1.g.) of his Circle's interim draft

"Perhaps we should consider having all thesis posted as electronic documents... Flexibility should be allowed for innovative ways of presenting research, without compromising the necessity of maintaining archival quality."

This shows unusual prescience identifying future trends toward information disclosure within our (scientific) culture, even where highly traditional forms such as dissertations are concerned.

- **Imaging Centre - Electron Microscopy/X-ray Spectroscopy Circle** [Wrzensniewski]

The connection here is self-evident. The microscopic cell becomes macroscopic, with the viewer now inside to study the fine structure.

- **Instructional Design and Digital Development Circle** [Campbell]

The Immersarium provides an excellent forum by which students may develop interactive hypermedia. Campbell's cadre of accomplished Macintosh "media-ists" now have a new paintbrush and canvas.

- **Research Centre for Visual Studies Circle** [McPherson]

The embracing and unencumbered nature of the screen provides for a viewer omniscience while peering into diverse anthropological and societal settings. Moreover, the Immersarium is itself a shared, visual and innovative collective experience rife for careful study.

- **Research Infrastructure Circle [O'Brien]**

The distinctive nature of the facility will outlive any current research and remain relevant well past 2010.

Specifics

While the 10m (33') internal dome can be housed in a conventional rectangular structure, I envision instead this dome set within a partially raised external dome (with conventional 1 meter stand-off from the internal hemisphere) thereby providing a distinctive thematic "note" to the physical plant. The incremental cost of the roof structure is minimal. Major costs are outlined in the final paragraph.

I have consulted, through contact with Buhl Planetarium, with the world specialists in domed theatres (Sky-Skan, Inc). A 10m dome with attendant space-frame can be constructed on-site for roughly 80K (US). Concrete pier (or hanging chain) anchoring with 2.5m perimeter wall supporting the hemisphere typically adds another 50% to this cost.

The projection system (a Definity Model 1) provides high output, high definition (1600x1600 pixel) field across a full 180 degree hemisphere of view using a central projector and fish-eye lens. The integrated computer system accommodates traditional media inputs (VCR cart/DVD), modern media (MP3 and QT files) and a general software interface. The latter is based on the DirectX software rendering model, making for a hand-in-glove fit with traditional Computer Graphics and simplifies interconnect with turn-key software applications. The system provides SMPTE (studio-grade) time synchronization, thereby facilitating multiple video sources. In addition, chroma keying, overlays and all other high-end studio functions are available, using both direct (touch screen) and remote control inputs.

Finally, the system comes complete with planetarium software, providing turn-key, out-of-box operation suitable for both public lecture and for basic through advanced collegiate astronomy instruction.

Background

I consider myself in a unique position to undertake the role of Champion of the Immersarium. I witnessed the birth of (what would become) IMAX at the Boeing Spacearium during the Century 21 Exposition and World's Fair (Seattle, 1962). My work as an engineer with Xerox Electro-Optical Systems (Pasadena, 1978) exposed me to high-end display graphics, the mouse and Internet and more importantly, underscored the cultural relevance of emerging (graphical display) technology. As an active participant in SIGGRAPH (beginning 1980) I am contemporary to and in dialog with work at the MIT Media Laboratory. As president of the Royal Astronomical Society of Canada (Waterloo chapter, 1985-6) I was both a researcher and participant in early digital CCD imaging and

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digital film production of astronomical imagery. Concurrent with my Ph.D dissertation in Computer Graphics (Waterloo, 1994) I consulted with the Buhl Planetarium in Pittsburgh, then in the process of upgrading from a traditional Zeiss optical projector to a Digistar I, which ran on high-end hardware and software nearly identical to my Waterloo doctoral experience.

In short, I am in an ideal position to assess the technical requirements of the Immersarium from this first proposal through first public presentation. I will be its champion.

Bottom Line

This is a prime opportunity to invest in a unique, lasting and central facility, which will draw interest, and excellence for many years to come. The projected cost is under one million dollars Canadian.

10m dome (perforated Aluminum) and space frame	\$80,000
Attendant dome structure, add-on bldg costs	\$45,000 (est)
Sound reinforcement	\$30,000 (est)
Definity 1 software package	\$455,000

Total	\$610,000 US
TOTAL (@1.40)	\$854,000 CAN
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Respectfully submitted,

Alan W. Paeth, Ph.D
(Faculty of Science)
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