Abstract
The planetarium world has experienced great changes in recent years, both in content display techniques as well as on the content creation side. We present a new tool to view and preview dome content, in order to help content developers to test their work easily without the need to use a dome, as well as to project content in domes using single projector systems.

Introduction
The content produced for fulldome projection is usually made in a frame (the Master) with a format corresponding to a projection of the dome on a plane. The standard is the fisheye projection, see Figure 1. Due to the distortions involved, looking at the Master does not give a clear idea of the final result once projected on a planetarium dome. The usual solution when creating content is to go through an interactive iterative process, making successive projections on a planetarium until the desired result is achieved. However, repeated access to a planetarium is difficult, costly and time consuming. So there is a need for a tool that can give the user a clear notion of the final result in the planetarium, direct to the desktop. In addition, if the tool could be used to show content in a small (single projector) planetarium, like a portable one, its versatility would increase substantially.

The software
DomeView is a real-time tool designed to view and preview dome content.

For previewing, DomeView displays the content projected in a spherical surface, like a planetarium dome, in 3D, see Figure 2. The viewing position can be changed, to mimic changing seats in the planetarium or even be viewed as if from outside the planetarium, see Figure 3. A model of a planetarium can be added for a more realistic view. To cope with many modern planetariums, the inclination can be set appropriately, see Figure 4. The entire dome can be displayed up to 360º, as in the all-sky view of the WMAP\(^1\), see Figure 5.

The viewing feature shows the content in a 2D projection of the dome and can be projected in a dome using a single video projector, for example a fisheye, see Figure 6. The content can also be viewed in a spherical mirror projection. This means a fulldome projection can be made in a planetarium using a regular projector and a spherical mirror, see Figure 7.

\(^1\) http://map.gsfc.nasa.gov
Domeview handles video and images of different types and content coming directly from third party programs such as Adobe After Effects\(^2\), Adobe Photoshop\(^3\), the free open source planetarium Stellarium\(^4\) and webcams. The media content is displayed according to the selected location in the dome, size and projection. If the media source is the fulldome Plugin\(^5\) under Adobe After Effects, see Figure 8, all options are disabled since the media are configured automatically.

**Features**

The software has a large set of features including:

- **3D previewing:**
  - Spherical View;
  - Cylindrical View;
  - 3D model imports, e.g. planetarium models;
  - Selection of the viewing position.

- **2D viewing:**
  - Fisheye projection;
  - Standard Projection;
  - Spherical Mirror Projection.

- Accepts different types of media content, videos (.mov, .wmv, .avi, mpg, mpeg, etc.) and images (.jpg, .gif, .bmp, .tga).

- Handles content arriving in real-time from other sources, Adobe After Effects, Adobe Photoshop, Webcam and Stellarium.

- Hyperdome ready (display from 0° to 360°).

**Summary**

A new tool was presented that:

- Offers extremely useful previewing capabilities.
- Is a powerful software tool for a digital planetarium, using both fisheye and spherical mirror projections.

Full details are available on the website\(^6\).

---

\(^3\) [http://www.adobe.com/products/photoshop](http://www.adobe.com/products/photoshop)
\(^4\) [http://www.stellarium.org](http://www.stellarium.org)
\(^5\) [http://fulldomeplugin.multimeios.pt](http://fulldomeplugin.multimeios.pt)
\(^6\) [http://domeview.multimeios.pt](http://domeview.multimeios.pt)