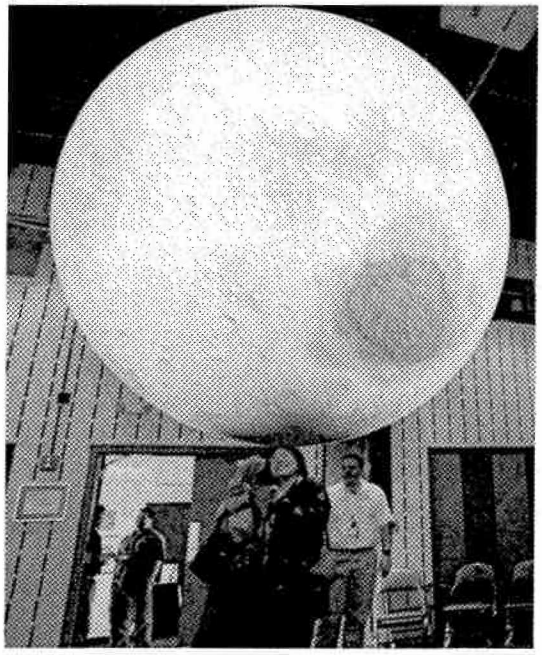
PLANETARY EDUCATION AND OUTREACH USING THE NOAA SCIENCE ON A SPHERE. A. A. Simon-Miller[1], D. R. Williams[1], S. M. Smith[2], J. S. Friedlander[3], L. A. Mayo[4], P. E. Clark[5], M. A. Henderson[6]. [1]NASA Goddard Space Flight Center, [2]Howard B. Owen Science Center, [3]QSS, Inc., [4]Honeywell Technology, [5]Catholic University, [6]ADNET Systems Inc.

Science On a Sphere (SOS) is a large visualization system, developed by the National Oceanic and Atmospheric Administration (NOAA), that uses computers running Redhat Linux and four video projectors to display animated data onto the outside of a sphere. Said another way, SOS is a stationary globe that can show dynamic, animated images in spherical form. Visualization of cylindrical data maps show planets, their atmosphere, oceans, and land, in very realistic form.

The SOS system uses 4 video projectors to display images onto the sphere. Each projector is driven by a separate computer, and a fifth computer is used to control the operation of the display computers. Each computer is a relatively powerful PC with a high-end graphics card. The video projectors have native XGA resolution. The projectors are placed at the corners of a 30' x 30' square with a 68" carbon fiber sphere suspended in the center of the square. The equator of the sphere is typically located 86" off the floor.



SOS uses common image formats such as JPEG, or TIFF in a very specific, but simple form; the images are plotted on an equatorial cylindrical equidistant projection, or as it is commonly known, a latitude/longitude grid, where the image is twice as wide as it is high (rectangular). 2048x1024 is the minimum usable spatial resolution without some noticeable pixelation. Labels and text can be applied within the image, or using a timestamp-like feature within the SOS system software.

There are two basic modes of operation for SOS: displaying a single image or an animated sequence of frames. The frame or frames can be setup to rotate or tilt, as in a planetary rotation. Sequences of images that animate through time produce a movie visualization, with or without an overlain soundtrack. After the images are processed, SOS will display the images in sequence and play them like a movie across the entire sphere surface. Movies can be of any arbitrary length, limited mainly by disk space and can be animated at frame rates up to 30 frames per second. Transitions, special effects, and other computer graphics techniques can be added to a sequence through the use of off-the-shelf software, like Final Cut Pro. However, one drawback is that the Sphere cannot be used in the same manner as a flat movie screen; images cannot be pushed to a "side", a highlighted area must be viewable to all sides of the room simultaneously, and some transitions do not work as well as others. We discuss these issues and workarounds in our poster.

NOAA primarily uses SOS as an education and outreach tool to describe the environmental processes of Earth. Goddard Space Flight Center has pioneered several efforts to extend the reach of SOS programming to include other bodies in the Solar System using data acquired mainly from NASA spacecraft. Our own work, funded through the Education and Public

Outreach for Earth and Space Sciences program, produced two programs for the SOS, one a tour of the Solar System and one focused on the planet Jupiter. The presentations are freely available to any institution that has an SOS or similar system; currently, there are 50+ sites worldwide, yielding a potential audience of millions of members of the general public each year. In addition, we have developed companion websites, lithographs, activities and an outreach newsletter to accompany the movies.