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Computer Control of Multiple Video Projectors

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Introduction

For the 35 years that I have been working with planetarium special effects, I have been bothered with the audio and video methods we have used, and the variety of controls that are necessary for presentations. Sophisticated controls have been devised and sold to make the job easier for lecturers, but at considerable cost, which is a limiting factor for small planetaria.

At Frostburg State University, our 24-foot dome has been used for college classes, monthly public shows, and a variety of elementary school shows. We have at times given as many as ten different presentations during a single month. These vary from standard theme-oriented public shows to specialized shows for the deaf. The variety can be numbing at times, and the most practical solution is sets of slide presentations intermixed with astronomical current events. This entails the changing of slide trays for each presentation with audio tape changes. Of course we suffered the plague of stuck slides, burned out bulbs, damaged or misplaced tapes, and other annoyances.

My solution was the development of a computer control of visuals, audio, and simple special effects. This simplified the task for the lecturer and eliminated the need for a show set-up. Finally the computer and associated software has advanced enough to make it easy to design shows that can be stored on the computer and simply called up as needed. Software is the key.

The First Step, Computer

Fortunately, cost of computing has gone down and capability has gone up. For less than a thousand dollars we were able to purchase a generic PC with the following capabilities: 850 MHz speed with six PCI slots, 64 Megabytes RAM, 40 Gigabyte hard drive. Also we purchased a bottom-of-the-line Sound Blaster audio card and a good quality CD read/write drive. Four Rage II video cards were donated. At first we only used one of the video cards that controlled the video projector, but this allowed the audience to see the Windows desktop when we used PowerPoint in a presentation. This is unacceptable for professional-looking presentations.

Since I first came to Frostburg from Hanseen in 1970 I have been trying to automate the planetarium and the effects I have built. It has been a struggle with many failures. When I finally was faced with the micro computer and the recent advances, I scrapped all those years of work to design this new system. I certainly learned a heck of a lot during the past 35 years, and I am happy to share that knowledge with everyone.

The Second Step, Audio

Our operating system is Windows 98. With this we have used Adaptec version 4 audio software for extracting audio from CDs. Many CD-RW readers come with this software, though it can be purchased separately for about $100. This software allows copying of audio files as well as extracting them to WAV files. Using this software is relatively simple, perhaps taking a couple of hours of practice to become proficient at using it. It allows the recording onto CD of data files, picture files, audio files, and the extraction and conversion of audio files from CD to the WAV files that can be played on the computer from the hard drive.

At first we played prerecorded CDs in our presentations. To do this we connected the audio output of the audio card to our sound system. To play the CD just insert the CD, and after a few seconds the audio player software appears. Click on the appropriate controls to select a track and play the CD. Under the View pull-down select Volume control for control of your volume. There is no need to reach around to your audio system to control volume any more. If you have never used this feature on your computer you will have to spend some time investigating the various controls of the mixer. Don't hesitate to try various options and customizing the mixer for your needs. Usually all you need is CD Audio, Line-In, and Wave controls. We do not use the other controls, and selecting Options then Properties on the mixer and deselecting the inputs that are not used can eliminate these from the display.

By using the Adaptec software, we extract the audio track of a standard audio CD into a WAV file and place it in an audio folder on our computer. By double clicking on this file, a WAV player will appear that is different from the CD player. This is the Windows Media Player. If you don't get this player automatically, you can select it from the Accessories menu under Programs and create a shortcut to your desktop.

At this point it is necessary to caution you about audio software. Depending on which software you have installed, and how you have installed it, different players may have precedence for audio playing. I have been fortunate in having access to some very bright students who have configured our computer. There are too many options to talk about. This article is about multi-media, and it cannot go into detail about all the things that can go awry. I assume the reader is either moderately adept at using Windows, or has an expert at hand for a guide. The foremost advice I can give is patience.

If you are an audio buff, the next step is to add the ability to audio edit your WAV files. We use CoolEdit 2000 available from Syntrillium.com. This is reasonably priced software, and the capabilities are nothing less than astounding. You can record audio from external sources, then edit out pops from old records, compress or expand time without changing pitch, mix up to four separate stereo tracks (using the studio mixer option), and much more. This also takes time to learn, but it is indeed worth it.

Getting the audio to work can take many cups of coffee, or even an occasional shot of Jack Daniels! Take it easy and learn to rely on local experts. You will eventually be successful.

We use PowerPoint from Office 2000. This is amazingly versatile. We do simple slide
presentations by inserting bit-map visuals into each frame. By using the automatic timing feature for presentation in dissolve mode, it is simple to synchronize the slide presentation to an audio track. The only danger when doing such a presentation is the possibility of the lecturer dozing off.

The Third Step, Two Monitors

Now for the fun stuff. If you only plan on using a single video projector, the problem is simple; all you have to do is buy a dual head card. We tried the Matrox G450 AGP card with success. Other models are available for both the AGP slot and for PCI. Installing this is simple; just plug it in and follow the directions for installation of the software. One connector is for monitor #1 (use this for the console) and the other connector is for monitor #2. Use this connector for your video projector. Since our projector is mounted at the base of the star projector, we used a twenty-five foot connector cord, and without ill effect. To make it easy to use in our small console area, we were fortunate to have donated a flat screen monitor with a small footprint. If you have an A4 projector with standard console, you know how valuable your space is.

When first activated, your projector may not show an image. When we first tested this card, we used a second monitor instead of the projector. To activate and arrange the position of the second monitor (or projector), position the cursor on your desktop and click the right mouse button, then select Properties at the bottom of the menu. This gives you the Display Properties window. Now left click on Settings. You can position the monitors anywhere you wish. We put them in a physical approximation of the planetarium projector vs. the desk monitor so that when the mouse cursor is moved toward where the projector is, the arrow moves to that monitor. Our setup has the second monitor (the projector) on the left (monitor #2) and the first monitor (#1) on the right, since our console is to the right of the video projector. You can even stagger their positions if you wish.

The setup should also take into consideration the screen area and the color resolution. We use 800 by 600 for the console monitor, 640 by 480 for the projector, and High Color (16 bit) for both. The monitor sizes in the window display will change their sizes to show this relationship.

The projector we used was an EzPro 450, which uses a special purpose medical bulb, EVD, that is rated at 36 volts and 7 amps. With only about 50 hours of life, it requires periodic replacement. Also, it is too bright. We solved part of the problem by using Microsoft Paint to create a background for the monitors of black with a dark red planetarium logo. However the slides and titles we projected were still too bright, so we had to add a filter on the lens to cut down the light. Soon we will be given an old nfinity video projector that uses an 82 volt lamp with reflector (an ENX ) we will replace with a 120 volt lamp (probably an EZK) which will give us extended life and a dimmer image. Much more usable in a planetarium.

Of course you can add a dimmer to these lamps, but not to the whole projector, since it contains electronics which will not work under decreased voltage. We have not had time yet to modify the lamp power supply to allow dimming.

If you are using Microsoft's PowerPoint software for titling, you must use the 2000 version in order to send your images to a second monitor. To do this, before you start your program, you need to select Slide Show and under it Set Up Show. At the bottom of the window you will see a pull-down that allows you to present your presentation on the second monitor. Unfortunately you cannot save this setting; it must be activated each time you present a show. PowerPoint allows not only titling but images as well. This is a cheap but effective way to create a set of slides for presentation on your projector. Unfortunately you will have to learn how to use PowerPoint. This is a very versatile tool. We highly recommend you take a class in its use or purchase one of the many books on the subject.

When using PowerPoint on the system, and sending the image to the second monitor (projector), your presentations will be much more professional since the audience will not see your desktop. Remember to create a black image using Paint as your desktop for the best presentation.

The Fourth Step, Multiple Projectors

Even more fun, now ... if you are a masochist: the implementation of more video projectors. This is where last year conflicts with this year as concerns the advance of technology. Since our planetarium has limited funds (only a couple of thousand a year for equipment) we have had to add to our equipment one step at a time. This is beneficial in a way in that we had to implement this computer control one step at a time. If we purchased everything all at once, it would have been overwhelming. We also relied on the donation of computer parts, many of which were a few years old. We found that the newer motherboards did not accept old parts in the combinations we required. Here are a few of the problems we encountered.

The newest motherboards scan cards usually starting at the first PCI slot closest to the CPU. A video card in the first slot will be monitor #1. The next slot will be #2, etc. Finally, the AGP slot is scanned for the final monitors. However some cards, if they are old enough, stop the scan. This happened with an old audio card and an Esoniq video card for driving TV monitors. We ended up, after many hours of experimentation, with the newer SoundBlaster card in the first slot, then three Rage II video cards in slots two through four, and an Esoniq video card in slot five. This eliminated the Matrox card in the AGP slot, which would not work. I believe that the last video card was the culprit, but since the Matrox card would not work with TV monitors (as advertised) we ended up with this configuration. My only advice is to use the same, modern, video cards. You may get the dual head card to work in these circumstances.

When you go to more than one video projector, the problem is how to send separate images to them. To solve this we designed a Visual Basic program that will drive these projectors with the images we wished to project.

The Visual Basic Driver

As a teacher of computer science, I am fortunate to have several knowledgeable students at my disposal. John Puffenbarger, a senior student, is one of them. He expressed the desire to improve his Visual Basic skills, and he was interested in the project. I was unable to find inexpensive software to accomplish an easy presentation of visuals with multiple projectors. So I designed it from the aspect of a user, then John wrote the code. Sounds easy, but it involved a minimum of a hundred hours of coding and testing. If you are a programmer, have fun! But it is more practical to purchase the program from John. His disk contains all the programs talked about here as well as instructions for setup and a tutorial for their use. Here are the description and interface requirements.

Visual images must already be stored in the computer. We used a medium priced HP scanner to scan slides and printed material. It takes a couple of hours to learn the software. The HP software we used came with our HP ScanJet 6300C. It allowed color and gamma tweaking and easy adjustment of the bit size of the images. (The HP software that comes with their under-$100 models is not as good.) Since our projector only accepted 640 by 480 size images, that was our standard size for most scanned slides and printed pictures. Some images would not fit this format so we
would make a best fit remembering that the top part of the screen was most important. Vertical images could be centered using Paint. Like most modern software, it takes practice, experimentation, and an open mind to find out how to use it most effectively. All images were saved in the bit-mapped format called BMP. This is easily used by Paint for resizing, stretching, flipping, and repositioning in a black field for centering of vertical images.

Another source of images is NASA.gov. This allows downloads of many spectacular images, but they are in GIF and JPG formats. You can use these with John’s software, but manipulation of the images will either require other software, or convert them to BMP files and use Paint to do your adjustments. A real labor of love!

If you are not familiar with all the visual formats, there are in excess of twenty of them. The more common are BMP, JPG, and GIF. The BMP are most easily manipulated, but they are not compressed and take nearly ten times the storage space of other formats. Of course with the modern hard drives available, this is not much of a problem.

From the user standpoint we created a visual interface that first asks for the show to be presented, loads the image names into a file and the displays a simple three-button window (the Show Controller) that displays the current slide, the next slide, and the previous slide. All the user has to do is click on the image and it is projected. The user can also go backward or display a black screen just by clicking on it. We have used it with standard shows very effectively.

### Creating a Show

The Show Creator is a program that allows selecting from a set of thumbnails each image you desire for a show. To assemble a program, navigate though a file structure, which displays a set of thumbnails of the images with titles. Click on the desired image and add it. Continue adding images until done, then save the series with a reasonable name. It also allows easy editing, all by point and click. Everything is standard Windows. If you are going to write your own program, be sure to have an expert in VB on hand who knows about array manipulation and file handling.

### Be Organized

When dealing with hundreds of images, the only warning is be organized. Here is how we organized our images:

- Art and Astronomy
- Cosmology
- Galaxies, etc.
- Clusters
- Deep Space
- Diagrams of Galaxy Types
- Local Space
- Messier Objects
- Milky Way
- History
- Instruments & Observatories
- Maps & Old Pictures
- Powers of Ten (from the educational film)
- Scientific Principles
- Scientists
- Solar System
- Asteroids & meteors
- Comets
- Earth
- Atmosphere
- Meteors & Meteorites
- Moon
- Moon & Earth
- Surface Features
- Views from Orbit
- Formation of Solar System
- Planets (separate folders for each planet and sub folders for moons)
- Sun
- Space Travel
- Apollo
- Gemini
- On Strange Worlds
- Satellites
- Space Shuttle
- Space Stations

We also have added folders of commercial shows. For these we number the slides from 000, 001, etc. since there is one button on the show creation software that will add all the visuals in a folder in alphabetic order. Using a three digit number for the slides adds them in the order of presentation.

### Special Effects

For utilizing special effects that require simple on/off control, I wrote a Visual Basic program that displays a push-button window for turning effects on and off. It only requires the lecturer to push an on button to activate it, and an off button to turn it off. No fade controls are available currently but are planned for the future. The interface is a set of solid state relay modules that get their signal from the parallel printer port. Any combination can be activated at the same time. As with all software, you can position the window wherever you want it.

### Problems

If you use PowerPoint, dissolve of images is possible only as blocks of pixels. John’s software only allows abrupt changes. Cross dissolve is being worked on.

If the computer fails, you are out of luck. A backup computer with backup of shows is needed. We have found that after a hundred hours of use, most computers are good for
International Planetarium Society Biennial Conference

July 14-18, 2002

Ing. Gabriel Muñoz, Director
Planetario Centro de Convenciones y Exposiciones de Morelia
Av. Ventura Puente y Camelinias
Apartado Postal 78
58070 Morelia Michoacan Mexico
+52 (43) 14-24-65 planetarium
+52 (43) 14-84-80 fax
cconvenciones@michoacan.gob.mx
http://michoacan.gob.mx/turismo/3036/cconvenciones.htm

The Planetarium and the Convention Center and Expocenter are located in the south of Morelia's downtown among a group of specially designed buildings surrounded by green areas.

Registration fee will be $320 US including transportation between some hotels.

We'll have paper sessions, workshops, guest speakers from the Astronomy National Institute of Mexico and from the Harvard Center for Astrophysics, folkloric music, square dances, and optional excursions for family members.

The Conference will be on July 14-18, 2002. The weather is very good with temperatures between 13 and 30 degrees celsius.

There are two airlines in our country, Aeromexico and Mexicana; the last one has direct flights to Mexico City.

For example: San Francisco, Chicago, Los Angeles, San Jose and Miami, with one stop in Mexico City; Aeromexico and other airlines have direct flights to Mexico City.

By bus, it takes four hours from Mexico City to Morelia by the ETV line that leaves from the West Bus Station (Terminal Poniente) every 30 minutes; the cost is $26 US. If arriving from the airport, there are taxis with tickets available inside of the airport; the cost is about $15 USD and tell the taxi driver "a la Terminal Poniente".

In Morelia, you can take a taxi out of the terminal; it costs 25 to 30 Mexican pesos to the hotels.

The hotel seat of the meeting of the International Planetarium Society in 2002 will be the Fiesta Inn Hotel in Morelia, located next to Planetarium "Lic. Felipe Rivera", Convention and Exposition Center, giving a special rate $90 US, single or double, plus taxes (IVA 15% and 2% additional); breakfast buffet is $12 USD plus 15% service.

Five minutes from the Planetarium we have Holiday Inn and Holiday Inn Express Hotels with 120 and 80 rooms each; they're located between movie theaters, restaurants, and shopping centers. The special rates in single or double are:

<table>
<thead>
<tr>
<th>Hotel</th>
<th>Room Rate</th>
<th>Tax on Room Rate</th>
<th>Breakfast Buffet</th>
<th>Additional Service</th>
</tr>
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<td>Holiday Inn</td>
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The transportation from the Holiday Inn, Holiday Inn Express, and Horizon hotels to the Planetarium, Convention and Exposition Center, will be provided by the organizers.

Looking forward to seeing you all planetarians in Morelia, my best wishes and regards.

(continued from previous page.)

several years of presentation use. We develop our images and shows on other computers which minimizes the time our planetarium computer is used. We only have to make sure that the file structure of the computer we are creating our shows on is the same as the planetarium computer.

Backups of image files are necessary, using CD-ROM writers. Backing up the whole computer on CD-RW discs on a regular basis is mandatory (and time consuming). Do it!

Summary

If you want your planetarium to enter the 21st century, and eventually make your life easier, start with a fast computer with a large hard drive. Add an audio card and use it for your programs. Then add dual monitor capabilities and use PowerPoint for simple presentations. Then add more video cards and projectors.

It has taken us about three years to get up to speed with audio editing, visual editing, etc. But it is well worth it. We can now change to a new show at the drop of a hat. As we add more shows to our computer our life gets easier and easier, and future changes in software promises smoother presentations and more time to be creative.

Specific problems in implementation are difficult if not impossible to solve via long distance; general questions can be addressed. I can be contacted at bert@frostburg.edu and John Puffenbarger can be contacted at jppuffenbarger0@yahoo.com. We welcome your comments and questions.
"The Stars for Bird Lovers" is the title of a planetarium show I would like to see someday. The show would use an interest in birds to help explain basic concepts in astronomy. One can do this because numerous celestial phenomena have bird names. Nine constellations have bird names. Four well-known nebulas have bird names. Also, some stars have bird names, and a famous star cluster has a bird name. In addition, one can draw numerous parallels between stars and birds. Anyone working in the planetarium field could make such a show easily and inexpensively.

The presentation could be a simple slide show with a narration. Many of the slides could show various birds. Recorded birdcalls would also be necessary. One obvious source for slides and birdcall recordings would be the local Audubon Society. It is likely the society would be willing to lend some slides and birdcalls for this purpose. Someone from the society might even be willing to assist in putting the program together.

When the slides of birds and stars, as well as recordings of birdcalls, are at hand, one is ready to assemble the program. What follows is a detailed plan for putting together a "Stars for Bird Lovers" show.

I suggest that one start the program by telling the people in the audience what the show is about. Tell them that you will first show them some celestial objects that have bird names. These celestial objects include constellations, nebulas, and a star cluster. Explain that you will also be making some comparisons between birds and stars. In addition, tell the group that at the end of the show you will explain how they can find some of the celestial objects with bird names for themselves in the nighttime sky.

Then turn to constellations with bird names. Tell the group that nine official constellations are named for birds. Tell the group what a constellation is and what it isn't. Then begin familiarizing the group with the nine constellations. Present them in this order: Swan, Eagle, Crow, Toucan, Phoenix, Crane, Dove, Peacock and Bird of Paradise.

Show several slides of swans. Mention that it is the epitome of gracefulness. Note that the swan is the inspiration for the famous ugly duckling story. Note also that the word "swan" finds its way into our language in a number of ways, such as "swan dive", "swan song", and "graceful as a swan". It seems fitting it should be honored with a spot in the heavens.

Then show a slide of the actual Swan constellation. Mention that there are several ancient myths that attempt to explain the presence of this constellation in the sky. Briefly relate the myth that tells of the youth Cygnus who was the brother of Phaethon. Phaethon, son of the sun god, drives the chariot of the sun dangerously one day. To save the world, Zeus hurls a thunderbolt killing Phaethon. His body is lost in the river Eridanus. Cygnus dives to recover his body for proper burial. He dives endlessly into the river but futilely. Zeus takes pity on him. He transforms Cygnus the youth into a swan.

At this point, explain to the group that the first three constellations they are seeing are ones they will be able to see for themselves in the real sky. Point out that the shape of the swan is basically a cross. Point out the neck, the wings, and the tail. Mention that this cross-shape is also an asterism called the Northern Cross. Interestingly, at Christmas time, in the early evening, the Northern Cross seems to stand on the western horizon.

Then move to the constellation the Eagle. As you show a few slides of real eagles, mention that Benjamin Franklin opposed the selection of the eagle as the national emblem of the United States. He argued that it was a bird of bad moral character. He did not prevail (Figure 1). Today we see the eagle as a common symbol in our society.

Then show a slide of the Eagle constellation. Mention again that this is a constellation that everyone will be able to see for himself or herself in the nighttime sky. Call attention to the three bright stars in a row that make this constellation easy to identify in the sky.

Next show some slides of crows and play some of their birdcalls. Comment on the pervasive negative reactions to crows. Many people dislike them. Our expression to "crow about" anything implies disapproved bragging. The collective name for a large group of these birds is a murder of crows.

Then point out the Crow constellation. Call attention to its simple shape. It resembles a lopsided rectangle. It makes recognizing this constellation in the nighttime sky easy. Mention the time of year that this constellation is visible.

Tell the group the myth that explains how the crow came to be in the heavens. It is interesting because even the myth attributes unpleasant traits to the crow. The myth calls the bird a raven. It states that Apollo sent the bird to bring him a cup of spring water. By the spring, the bird saw a fig and waited for it to ripen. When the bird returned with a cup of spring water, he had to explain his lateness. He said a serpent, a hydra, which he had killed and brought back, had attacked him. Apollo knew the story was untrue and banished all three forever to the sky. As punishment the crow sits next to the cup but never gets to drink from it. The constellations Crow, Hydra, and Cup are next to each other in the sky.

Next, show a few slides of toucans. Point out the toucan's colorfulness and its unusual bill. Mention that the toucan is very adept at using its bill. It can manipulate small berries at the tip of its bill with ease. Also mention

Figure 1. Though called a bird of bad moral character by Ben Franklin, the eagle is honored as our nation's symbol and in many other ways.
Next, show slides of the imaginary bird called the phoenix. As you show them, tell the group the legend of this mythical bird. The myth said that the bird was brightly colored with red and gold feathers. It had a beautiful voice. Its life span was 500 years. As it neared the end of its years, it built a pyre, lit it, and jumped into the fire. The flames consumed it. Then, most amazingly, a new bird would arise from the ashes.

Next, show the Phoenix constellation. It lacks bright stars. It is interesting to note, though, that supernovas are stars that are somewhat similar to the mythical phoenix. They shine for a long time, and then suddenly they brighten and explode. From the remnants new stars eventually form.

Next, show some pictures of cranes. Mention that their voices are extraordinarily strong. Play some examples of their booming voices. In addition, of course, comment on their beauty. Then show the Crane constellation. The stars are faint, but you can show that they resemble a bird in flight. The crane flies with its long neck extended. You can show that the stars somewhat capture that feature of the real crane.

Pass over the other three constellations with bird names more quickly. They are the Dove, Peacock, and Bird of Paradise. The reason for passing over them more quickly is that the actual star groups that represent each bird are rather nondescript. To say that the faint star patterns in these constellations represent real birds calls for too much of a stretch of the imagination. Yet, show the constellations that represent these birds. Mention that the dove is important as a symbol of peace and that both the peacock and bird of paradise are very colorful birds. Then move on to nebulas that resemble birds.

Tell the group that other celestial phenomena besides constellations have bird names. Nebulas are one of these. Explain briefly what a nebula is. The word means "cloud," and just as we imagine shapes in atmospheric clouds, astronomers imagine shapes in nebulas. Then show a slide of the Owl Nebula, M97. Follow it with a slide of a real owl. Certainly, play some owl hoots.

Next, show a slide of the Pelican Nebula. Follow it with a slide of real pelican. Play the call of the American White Pelican. Next, show a slide of the Eagle Nebula, M16. Follow it with a slide of a diving eagle. Next, show a slide of the Swan Nebula. The Horsehead Nebula is another of its names. Follow it with a picture of a swan in flight.

Next, turn to a star cluster that has a bird name. Tell the group that, while a gathering of birds is a flock, we call a gathering of stars a cluster. Then show a slide of the Wild Duck star cluster, M11. The group will have to use its imagination to see a connection between the cluster and a wild duck. Show a slide of a wild duck in flight to help everyone's imagination. Also, play the sound of wild ducks quacking.

Next, point out some comparisons between birds and stars. Mention that both birds and stars can vary greatly in size. Show a few slides of stars such as wrens, hummingbirds, and ostriches to illustrate the variation in bird size (Figure 2). Then show some examples of red giants, super giants, and dwarf stars. Comment briefly on what size differences signify about stars.

Then tell the group that stars have various colors just as birds do. Show a few slides of colorful birds. Then show the variety of colors that stars may have. Comment briefly on the relationship between star color and temperature.

Then turn to bird names. Mention that besides common names, birds also have scientific names. The genus and species names are Latin. For instance, the American Crow is Corvus brachyrhynchos. Corvus is the genus name of crows. The same word, Corvus, is also the Latin name of the Crow constellation.

Illustration: Figure 2. Ostrich is to birds as is to stars?

Show a couple of other examples in which the Latin name is the same for the genus of a bird and the name of the constellation. Show some slides of birds and constellations to accompany your comments.

Then make this comparison between birds and stars. Mention that we see some birds all the time, some just in certain seasons, and some we never see. Tell the group that stars are very similar to birds in that respect. Show that some stars, such as those in the Big and Little Dippers, are visible every night of the year. Other stars seem to migrate like birds. Orion is most prominent in winter. It is absent from the evening sky in the summer. Scorpius, on the other hand, is just the opposite. It is prominent in the early evening in summer, but it is absent in the evening sky in winter. Other stars, like those in the Southern Cross, are never visible to us because of where we live. Of course, the shape of the earth and its orbit around the sun account for these phenomena. The capabilities of a planetarium lend themselves perfectly to a brief explanation of why we see some stars all the time, others only part of the time, and still others not at all.

Then make one more comparison between birds and stars. Tell the group that while everyone knows that some birds are endangered, not everyone is aware that stars might be considered endangered too in a different sort of way. Explain a little about light pollution. Brighten the lights a little in the planetarium to show it causes some stars to seem to disappear. Mention the Dark Sky movement and tell what people can do to lessen the problem of light pollution.

At this point, you have reached the last part of the show. In it, you will demonstrate how to find some bird constellations and stars in the real sky. Obviously, the time of year would be summer or fall. Suggest to the group that to find the constellations the Swan and the Eagle, they should go outdoors about 45 minutes after sunset. Tell them in what direction to look. Soon a few bright stars will become visible. Explain that three of the very bright stars will soon have the shape of a big triangle. This triangle is an asterism whose name is the Summer Triangle. Simulate this slow appearance of the Summer Triangle in the planetarium.

Tell the group that the brightest star of the triangle is the famous star Vega. Interestingly, the word means vulture. Show that the second brightest star is Altair. It is the brightest star in the Eagle constellation. The word comes from the Arabic word for eagle. The third brightest star in the triangle is Deneb. It is in the constellation the Swan. Its

(Please see Birds on page 34)
Abstracts and titles from 1999 and 2000 issues of Twilight published by the Japan Planetarium Society

Kazutaka Kato, Publications Chair
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kato@scitech.pyonta.city.hiroshima.jp

This article inaugurates the exchange of materials between the Planetarium and Twilight.

Twilight is the journal of the Japan Planetarium Society (JPS). It is published three times a year. While the journal's language is Japanese, many articles are also printed with English titles and some articles include abstracts in English.

Here are selected titles and abstracts from three recent issues of Twilight.

Twilight No. 18 (August, 1999)
The just-fits music for Planetarium
On the copyright law for Planetarium music
A teaching program for the Leonid meteor storm
My memory of the Akashi Planetarium
An official handbook of the Osaka Planetarium
JPS 1999 Meeting Program
Leonids '99: Invitation to International Joint Observation by High-School Students
Message from JPS Representative (Shoichi Itoh)

JPS is one of the affiliate members of IPS. IPS is for planetarians who would like to be more powerful and creative. IPS serves to prepare various occasions to study techniques for planetarium productions, to communicate knowledge about astronomy education between people who come from all over the world, and to support show production by supplying materials such as published resources and media services. I promise that people who join JPS always will be encouraged. (This article also includes a list of titles of recent articles in the Planetarian.)

A status report on the JPS webpage
PLANET; JPS mailing list

Twilight No. 19 (December, 1999)
Planetarium programs on the bases of children’s various thinking (Dr. Yasuo Matsu­
mori, Yamanashi University).
What is the role of a planetarium as a social education facility these days in which the curriculum of schools has been changing? The author puts his emphasis on “importance of proving intellectual productivity of the planetarium” in his lecture. He suggests that we should recognize children's various thinking to prove educational effects of the planetarium.

Planetarium show “Wonder of space, wonder of you” — for the planetarium in which the audience takes the initiative. (Mariko Takahashi, Yamanashi Science Center)

At the Space Theater in the Yamanashi Science Center, a planetarium program “Wonder of space, wonder of you” has shown from July 10 to September 29, 1999. This show was produced based on children’s questions about space. It is the “interactive planetarium show” in which the story changes as the audience chooses. In the JPS 1999 annual meeting, participants experienced the show. In this paper, the author introduces a plan of the show and its characteristics and considers subjects of the future.

Educational Planetarium Programs for Children of 3 to 5 years.
Part 1. Purpose and Process (Reiko Funayama)
We have studied the children's view of the universe, cognition of time and space, and objects of interest since April 1999. Those have seldom been studied in Japan. Based upon this result, we are going to produce an educational planetarium program about the Sun and Moon. We will try to evaluate this program by showing it to children in several planetariums.

Part 2. Interviews with children (Hiroki Iwagami)
To produce better educational planetarium program for children of 3 to 5 years, we investigated the children's image of the heavenly bodies by interviewing them directly. The preliminary results are presented.

Part 3. Questionnaire sent to teachers (Hiroko Takahashi)
To recognize a child's view of the world, we have sent out questionnaires to teachers of kindergarden and nursery schools. A gender difference is found in objects of interest for 3-year old children and it becomes more significant for children of 4 to 5 years. Children’s interests of the nature and cognition of time and space develop quickly with their age.

From Kilo to Mega—Creation of a New World of 1.7 Million Stars (Takayuki Ohira)
This article appeared translated in its entirety in the December 2000 issue of the Planetarium.

Research on Exhibition of Astronomy in a Museum (Hiromichi Gan, Hiratsuka City Museum)
We researched The Astronomical Exhibition in a Museum and published a report. Many ordinary exhibitions were conformed to the schoolbook and historical events. Now we must produce new ideas that depend on a modern astronomical science.
The joint use of web-page technology in an exhibition (Yoshiya Watanabe, Science Museum of Osaka).

The joint use of web-page technology in an exhibition and the web-site at Science Museum of Osaka is discussed. In the article, some problems about it are pointed out. And then, I present how to solve the problems.

Transplantation of "The Trip of the 3rd Planet Orbit" (Hasegawa Takayo, Shiroi Community Culture Center Planetarium)

In the spring of 1999, we transplanted "The Trip of the 3rd Planet Orbit" that was made in the Hiratsuka Museum Planetarium of Shiroi and projected it. I report the circumstances and problems and the solutions of program transplantation.

IPS Media Service

IPS Montreal

Activity Report of the IPS Education Section 1998 (Tatsuyuki Arai, Katsushika City Museum)

(this issue also includes descriptions of selected Japanese planetariums.)

Twilight No. 20 (September, 2000)

Gifu City Science Museum

We'll have the 9th IPS meeting at the Gifu City Science Museum from November 7-9. Information about our museum, the planetarium, telescope, astronomical exhibitions, events, and traffic access.

Let's go gazing the Northern Lights (Madoka Fukushima)

I went to Alaska for the first time to watch the Northern Lights in 1990. Then, I was enchanted by the Aurora and now I have gone to Alaska and Finland 11 times. Here, I gathered the latest information about the Aurora and many tips about traveling to the areas which can see the Aurora, based on my experience.

Solar Eclipse Watching at Black Sea (Shoichi Itoh, Suginami Science Center)

We, 39 members, have joined the Solar Eclipse Cruise at Black Sea by Stella Solaris. In this article I would like to introduce our cruise and how we were able to see the total solar eclipse on the ship. The planning process of this voyage is also mentioned.

Visitng the home country of star myths—travel to Delphi (Shoichi Itoh, Suginami Science Center)

The Greek myths were originally conveyed from mouth to mouth. Then they were collected and grew up from story-telling to literature. For understanding the composition mythology, I will introduce my travel to some places in Greece, such as Delphi, Rhodes, Crete, Corinth, Mycenae, and Athens, and their related myths. In this first article, I will tell about Thebii, the Kadmos' country, and Delphi. I would also like to explain how Apollo's Oracles were done.

Encounter with the 1999 Leonid Meteor Storm (Shinsuke Abe, National Observatory of Japan)

The Leonid Multi-Instrument Aircraft Campaign (Leonid MAC) is a NASA and USAF sponsored interagency and international effort to study a rare natural phenomenon, a meteor storm, for clues to the composition of meteoroids, cometary debris, and the emission processes. On the night of November 18, 1999, two aircraft took off on a mission to rendezvous with the Leonid Meteor Storm from 12 km up, flying about 150 km apart, with over twenty instruments pointing out the Leonids, capturing images, and making spectroscopic observations. Through observation of meteors, physical and chemical properties of cometary meteoroids can be studied directly from the details of their interactions with the Earth's atmosphere. The road to knowledge of comets, the early solar system, and life leads through the meteors.

A Planetarium show and star watching party for hearing handicapped people (Toru Kusuhara, Kurashiki Science Center)

Last winter, we held a planetarium show and star watching party for hearing handicapped people at the Kurashiki Science Center. It was the first time for us to tackle a planetarium show with subtitles attached, and the project was a success to some degree. But we must solve many problems in the future in order to make the planetarium really enjoyable for handicapped people.

Report of the IPS Tokyo Block Meeting (Shiomi Hamamura, Suginami Science Center)

The IPS Tokyo Block Meeting was held at Sunshine Planetarium on October 26. In this meeting, Dr. Bill Gutsch, the past IPS president, gave a lecture in English about a live planetarium show.

Rose Center for Earth and Space

Report of the 1999 IPS Council Meeting (Shoichi Itoh, IPS Representative of IPS)

(this issue also includes descriptions of selected Japanese planetariums.)
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meeting. Workshops will be held under her
2002 we plan to meet in at the Maryvale
umn.
port from Learning Technologies, Inc., and
one, and several workshops were planned
planned so teachers only needed to miss one
teachers only needed to miss one
planned so teachers only needed to miss one
teachers only needed to miss one
This list of participants to date:
1995 Susan Reynolds (OCM BOCES Planetarium, Syracuse, New York)
1996 Jeanne E. Bishop (Westlake School Planetarium, Ohio)
1997 Jerry Vinski (Planetarium of the Raritan Valley Community College, New Jersey)
1998 Dee Wanger (Discovery Center Science Museum, Fort Collins, Colorado)
1999 April Whitt (Fernbank Science Center, Atlanta, Georgia)
2000 Raymond Shubinski (East Kentucky Center for MST, Prestonsburg, Kentucky)
Each participant felt it was an excellent
and they represented well the
community of Starlab educators. If you are a
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resides in the USA and works with Starlab,
please complete the application which follows
and send it to me by March 15, 2002.
Here are some tips for a successful contest entry:
• Make sure that you emphasize your experience with Starlab (Learning Technologies, Inc., wants you to represent their product well).
• Send an audiotape of a "live" lesson. (Loris Ramponi, the Italian host for this adventure, wants to hear the way that you interact with students.)
• Provide a script of your lesson, a list of specialized vocabulary, and copies of any materials you will use in a pre or post planetarium lesson activity. (This gives students a chance to learn more English words as well as more science. If they have these materials before you arrive they can practice and be prepared to learn more. This also makes it easier for you to feel free to adlib a bit and not have to quote your script word for word. They will get the ideas more quickly and be able to respond more freely.)
Make sure you include some Native American mythology as part of your lesson.

PIPS Meetings:
By the time you read this, a two-day meeting of Powerful Interactive Planetarium Systems (PIPS) will have been held on Friday and Saturday, September 14 and 15. Typically planetarians who are working either full or part time in a small or portable planetarium do not attend regional or international meetings. This mini-conference was planned so teachers only needed to miss one day of school and their only costs were for travel, room and dinner! This meeting was planned so teachers only needed to miss one
teachers only needed to miss one
teachers only needed to miss one
teachers only needed to miss one
This is the list of participants to date:
1995 Susan Reynolds (OCM BOCES Planetarium, Syracuse, New York)
1996 Jeanne E. Bishop (Westlake School Planetarium, Ohio)
1997 Jerry Vinski (Planetarium of the Raritan Valley Community College, New Jersey)
1998 Dee Wanger (Discovery Center Science Museum, Fort Collins, Colorado)
1999 April Whitt (Fernbank Science Center, Atlanta, Georgia)
2000 Raymond Shubinski (East Kentucky Center for MST, Prestonsburg, Kentucky)

American in Italy Contest:
People ask, "Why do you only report on
an American/Italy exchange?" The answer is,
I know of no other exchange between countries at this time.
If you want to try the same kind of contest with students in your country taught by teachers in another, contact
Loris Ramponi and find out how he set it up!
Then, let me know and I will publish news about it regularly!
Each year Serafino Zani Astronomical Observatory (Lumezzane/Brescia), in collaboration with the IIS Mobile Planetarium Committee and with the support of Learning Technologies, Inc., hosts an American Planetarium Operator who presents lessons in English with the itinerant planetarium Starlab to high school students of English. Transportation from the United States is provided, along with bed and some meals from Monday to Sunday.

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Each participant felt it was an excellent adventure and they represented well the community of Starlab educators. If you are a qualified and talented individual who resides in the USA and works with Starlab, please complete the application which follows and send it to me by March 15, 2002.
Here are some tips for a successful contest entry:
• Make sure that you emphasize your experience with Starlab (Learning Technologies, Inc., wants you to represent their product well).
• Send an audiotape of a "live" lesson. (Loris Ramponi, the Italian host for this adventure, wants to hear the way that you interact with students.)
• Provide a script of your lesson, a list of specialized vocabulary, and copies of any materials you will use in a pre or post planetarium lesson activity. (This gives students a chance to learn more English words as well as more science. If they have these materials before you arrive they can practice and be prepared to learn more. This also makes it easier for you to feel free to adlib a bit and not have to quote your script word for word. They will get the ideas more quickly and be able to respond more freely.)
Make sure you include some Native American mythology as part of your lesson.

The Italian people are really interested in this and each participant has already presented some myths. You can write to Loris at info@serafinozanit.it and get information about what topics and myths have already been presented in the past and/or what he would like to see in your lessons.)
• Get your application in on time. (I need to send copies of all applications to Jane Sadler and Loris Ramponi and then confer with them to pick a winner. This takes time and you need to know if you won before school lets out so you can make plans for October.)
• Apply more than once. (If you are not selected — try, try again. Ask for comments about why you were not selected and what you can do to make your next application better. You can do it and we will give you help!
So, don't delay. Get busy right now planning and completing your application. As soon as you get back to giving presentations, in the fall, start tapering yourself with students and then pick the best tape to send to me by March 15". This is a golden opportunity; don't let it pass you by!

GLPA/SEPA Portable Planetarium Workshop 2001:
Sharon Mendonsa (Sudekum Planetarium, Cumberland Science Museum) and I decided to join forces this year to conduct a workshop at the SEPA/GLPA Conference. Sharon has been successful in increasing interest and attendance for this kind of workshop at the SEPA conference each year. She faithfully sends me the minutes of the workshop for publication in the Planetarian "Mobile News Network" column. This year we will join in writing a report that will be included in the December column.

Keep in Touch:
Please send cards and letters, or e-mail, with news of what you are doing and tips for helping others in your profession so that I can share your ideas and concerns with portable planetarium colleagues around the world.

The application for "A Week in the North of Italy" appears on the following two pages.
A WEEK IN THE NORTH OF ITALY

A Proposal for an American Planetarium Operator

October 21-27, 2002

Each year Serafino Zani Astronomical Observatory (Lumezzane/Brescia), in collaboration with the IPS Mobile Planetarium Committee and with the support of Learning Technologies, Inc., will host an American Planetarium Operator who presents lessons in English with the itinerant planetarium Starlab to high school students of English. Transportation from the United States will be provided, along with bed and meals from Monday to Sunday (lunch and dinner Saturday and Sunday, on your own).

The program for the week is as follows:

**Monday, October 21:**
- **Morning:** Arrival
- **Afternoon:** Visit astronomical facilities in Lumezzane and Lumezzane Observatory

**Tuesday, October 22:**
- **Morning:** Present lessons in a school
- **Afternoon:** Free time

**Wednesday, October 23:**
- **Morning:** Present lessons in a school
- **Afternoon:** Free time

**Thursday, October 24:**
- **Morning:** Present lessons in a school
- **Afternoon:** Present workshop for teachers

**Friday, October 25:**
- **Morning:** Present lessons in a school
- **Afternoon:** Free time to visit the city of Brescia and astronomical sites of the city
- **Evening:** Give presentation about mythology to the general public in the Lumezzane Planetarium

**Saturday-Sunday, October 26-October 27:**
- **Free time for touring Venice, other cities and/or other Italian planetaria**

**Monday, October 28:**
- **Departure for USA**

**From Tuesday to Friday:**

Starlab lessons in a secondary school.

There will be no more than four lessons every morning for a total of four each day. Each lesson will be at least 60 minutes in length and can be about traditional topics for planetaria such as daily motion, orienteering, latitude motion, solstice and equinox, constellations, and so on. Or, the non-astronomical Starlab cylinders can be utilized for a lesson about such topics as: biology, tectonics, geography, ocean currents or meteorology. A classical night sky presentation on mythology is very popular. The final part of the lesson could be dedicated to Native American mythology by using the related Starlab cylinder.

The morning astronomical lessons may be in Brescia or another nearby city. All lessons and presentations will be conducted in the American language. A preliminary text (or photocopy from a book) of the lesson is required, along with a glossary of vocabulary words, so teachers will have ample time to work with their students before the Starlab experience. It is important for the students to learn new words, such as those used in mythology. Be prepared to teach the lesson at either a basic or an advanced level. Some classes are extremely interested but do not know a lot about astronomy and others have studied astronomy in depth. Most of the students have had two to four years of English and will understand the spoken word if you speak slowly, clearly and deliberately. They have a good sense of humor and certainly display the usual excitement about Starlab. You can use a short introduction outside the dome that includes a simple activity. (It is not necessary for every student to have something, i.e. a star wheel or map in their hands, for this activity.) You could also explain how it is the “American way” to use simple materials to introduce a lesson. Relax and use a fluid style and keep it simple, not extremely technical.

If you feel comfortable about it, perhaps you could make a one hour presentation each morning to the student body during which you could show a few slides about your facility and your work with students in America. (This is not a mandatory part of the experience.)

During the afternoons there are no other engagements, providing an opportunity for touring the locale and nearby cities. Lumezzane is very rich in the public astronomy field with the Serafino Zani Astronomical Observatory, four small planetaria, the Eureka Astronomical Center and the National Archive of Planetaria. Brescia Province is very interesting for its natural landscapes and parks, three lakes and a most important valley for prehistoric age stone engravings. Important artistic cities, such as Verona and Venice, are nearby and can be reached by taking a one or two hour train ride.

**Thursday Afternoon:**
- Eureka Astronomical Center: Annual workshop for teachers and planetarium operators.

This workshop is advertised at the national level. The presenter will demonstrate the versatility of the Starlab planetarium and all the cylinders. During the workshop for teachers you will demonstrate how to set up and use a Starlab dome and projector and demonstrate planet and moon placement as well as all the available cylinders. We encourage you to also share any other experiences you have had while teaching astronomy to students. The workshop participants are people who are interested in learning how to make exciting and effective presentations using Starlab. During this workshop and on Friday evening you could show a few slides about your facility and your work with students.

**Friday Evening:**
- A presentation of Native American (or other cultures such as African or Chinese) mythology and constellations for the general public.

The presenter will provide an introduction with slides, about his/her experiences in the diffusion of astronomy in the United States, and then make a presentation inside Starlab.

**Culminating Documentation:**

We request a final report be written by the American teacher which will include the text of the High School lesson, comments from the students and impressions of the experience. Learning Technologies, Inc. will pay for your airfare when you submit a copy of your final report to them along with a copy of your ticket receipt showing the cost of your flight.

For other information and/or to receive the reports about American Lessons with Italian Students, written by previous winners, write to:
A WEEK IN THE NORTH OF ITALY
2002 Application Form

Name: ____________________________________________

Address: __________________________________________

Phone: _______________________________ Fax: _____________

E-mail: ____________________________________________

Age: _______ Profession: ______________________________

Experience: Please enclose a resume/curriculum vitae and a live tape-recorded lesson as you present it to students. (These items will not be returned. The taped lesson will be placed in a public domain file for students and teachers.) Please use the standard size audio and/or videocassette, not a mini-cassette.

Proposed Text: Specify your proposals for the morning lessons, Thursday workshop and Friday public presentation. Enclose text and glossary.

Other Comments: __________________________________

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Vernal or autumnal, this equinox brings new growth, whether your planetarium is beginning school programming or preparing for spring break. And here some offerings of the season. If you’re heading out stargazing, check out the new field guides reviewed here. Rain trapping you indoors? Browse some history or philosophy.

Our thanks to the publishers of the books and software, and to the reviewers who bring you this column: Richard Dreiser, Tony Fairall, Terry Johnson, John Mosley, and Ken Wilson.


Some of the most elegant and fascinating images from astronomy’s historic past are those of ancient diagrams and star maps. Davide Neri has gathered almost 500 of these images for his CD-ROM, Atlas Coelestis.

More of a hypertext ‘book on CD-ROM’ than a computer program, Atlas Coelestis contains images from such famous publications as Bayer’s Uranometria and Flamsteed’s Atlas Coelestis. The images are supplemented by brief text sections describing the history of celestial cartography and the basics of celestial cartography; a brief chronology (ending at 1925) of the subject; and a brief discussion of the development of cosmological thought that paralleled these historic images.

Navigation through the text and images is through the, by now, very familiar click on the hypertext word to go to that image or subject. The layout of the navigation links, however, is unique to this disk and differs a bit from the web browser formats that we’re all getting used to these days.

For any CD-ROM such as this one, the key potential selling point is the quality and utility of the images it offers. Unfortunately this is where Atlas Coelestis falls short. The images are in the obscure Toolbook format that makes them difficult to use in other applications. Furthermore, most images are available in only one or two levels of resolution. Sadly, neither level shows more than hints of the great detail that exists in the original (or even other reproductions) of these star maps and charts.

"If ancient star maps and charts are one of your areas of interest, you might want to add Atlas Coelestis to your collection."

The accompanying English text of Atlas Coelestis is also lacking. It seems to be a translation from what I’ll guess was originally Italian. Although it is easily understood, it shows odd grammar quirks from a ‘not quite professional’ translation. This lack of polish would keep many of us from using it in U.S. K-12 schools due to the mixed message it would give students about the importance of good English grammar. Other weak points are the lack of references for the historical information or an bibliography.

On the plus side, this CD-ROM loaded quickly and easily on my Windows 2000 machine, even though the accompanying instructions only mention Windows 3.1 or Windows 95 installations.

If ancient star maps and charts are one of your areas of interest, you might want to add Atlas Coelestis to your collection. Just don’t set your too high because the image resolution and utility isn’t quite where you’d expect it to be.


In his brief Introduction to Asteroids, Peebles states simply that the intent of the book is to discuss the history of the asteroids and what we know about them. “Two hundred years ago humans did not even know that asteroids even existed. Human ideas about the asteroids have changed significantly in that time. First viewed in the early nineteenth century as the equal of the great outer planets, they were, by the end of it, relegated to the status of little more than ‘vermin.’” (page one, paragraph two).

Shortly after the beginning of the twentieth century, Edwin Hubble made two great discoveries, that some nebulae were ‘island universes’ (now called galaxies) and that the universe is expanding. Astronomers looked beyond the stars to distant galaxies, giving little thought to the solar system. Hubble’s observations were expanded upon. Astrophysicists busied themselves with cosmology and the origin of the universe, and, with the exception of a couple of astronomers (such as Gerard Kuiper), abandoned their interest in the solar system.

Only in the last three decades have astronomers renewed their interest in the asteroids, many of which orbit between Mars and Jupiter. We have come to realize that asteroids can tell us a lot about the solar system, its very origins, as well as the origins of Earth’s Moon. By 1978, evidence had begun to accumulate that would explain the very demise of the dinosaurs. That a large asteroid could have struck the planet causing mass extinctions was initially considered “an appalling idea.” And yet, today, the prevailing opinion is that sixty-five million years ago, an asteroid impact did precisely that.

In the last three decades we have determined “their mineral composition, we have imaged their surfaces by radar and orbiting telescopes, and we have flown space probes by them. Some show signs of undergone volcanic flows, while others contain water and ice. We have come to understand that asteroids provide a glimpse into the origins of the solar system itself.”

The idea that some planet must exist between Mars and Jupiter was initially based entirely on bad science. It was “predicted” in the 1770s by Titius and Bode, a mathematical formula, (the Titius-Bode Law) no more than a cosmic coincidence, that “explained” the distances of the planets from the Sun,” (and not-too-accurately, incidentally). Uranus nearly fell into the space so predicted, and the hunt for the “missing” planet between Mars and Jupiter began in earnest.

On January 1, 1801, it looked as though the planet had been discovered. There was no way to tell the size of the new planet, and no suggestion that there might be others in roughly the same orbit.

By 1809 a method had been developed for determining orbits when a second, third, and fourth object were discovered. By 1855, so had a fifth. Olbers (the same Olbers of Olbers’ Paradox) was apparently the first to suggest that the asteroids were fragments of an exploded planet.
By the 1890s, over 300 asteroids had been discovered, and, with the advent of photography applied to astronomy, thousands more would be.

Asteroids began to appear in places other than between Mars and Jupiter. Jupiter’s gravity pushed groups of asteroids apart in between the Kirkwood Gaps, and gathered others together. Asteroids moved in stable orbits ahead of Mars as well as behind.

“Two hundred years ago humans did not even know that asteroids even existed. Human ideas about the asteroids have changed significantly in that time.”

As more asteroids continued to be discovered, astronomers developed new naming and numbering systems. Attempts were made to actually measure the sizes of the larger asteroids. Peebles blunders though when he says, “In 1894, E.E. Barnard used the 36-inch and 40-inch refractors at the Lick and Yerkes Observatories to measure the size of the first four asteroids” (page 26, paragraph one). Yerkes Observatory was not completed until 1897; Peebles’ date may be wrong, or, more likely, Barnard did the work at Yerkes later.

By 1918, the idea of distinct asteroid families became reasonably firmly developed. Peebles does an excellent job of explaining the differences and similarities among these diverse groups.

By 1935, following Hubble’s revolution, fewer and fewer astronomers bothered to try discovering or studying asteroids. This was also at least in part because of Percival Lowell’s exaggerated and unwarranted claims that life exists on Mars. “As within the astronomical community the Lowell Observatory became an outcast, planetary astronomy went into a great decline, and the amateurs role in astronomy ended.” (Page 28, paragraph two). At least for the time being.

Not until well after the Second World War would astronomers come to be interested again in the “vermin of the skies” The development of the photomultiplier tube and the use of computers revolutionized astronomy beginning in the 1950s.

“In 1971, [Tom] Gehrels organized the first asteroid conference in Tucson, Arizona. There were about 140 participants at the five-day meeting — astronomers, geologists, chemists, and physicists specializing in asteroid studies” (page 32, paragraph two).

“A look through the index is not possible as there isn’t one! (How is one to look for, say, NGC 5128?) The chapter titles, listed in the table of contents, are worded concisely enough to help one find what one is looking for without undue difficulty. I recommend that future editions contain an index.”

Despite this annoying lack of an index, how does Deep Sky Observing measure up to its author’s own definition of “worthy of consideration”? The table of contents poses questions, such as “Who Can Benefit from this Book?” It answers this and other questions about the best observing sites; how to maximize one’s observing time; useful accessories and other tips; why note-taking is useful; what can be observed in galaxies beyond the Milky Way; and what can be observed in a cluster of galaxies (including a very useful table of Abell Galaxy Clusters).

Other chapters cover: different kinds of nebulae and what can be observed in each; open and globular star clusters; using binoculars; using a computer to enhance deep sky observing; and doing public observing programs. There are many other useful tips about eyepieces, focal lengths, filter use, and so forth. An appendix lists an excellent Supplementary List of 110 Deep Sky Objects, with details.

... a fine, useful, well-written, reasonably-complete, and portable guide to most aspects of deep sky observing with the telescope and binoculars.”

The last chapter, “A Magical Evening,” ties everything together, as the author provides a detailed account of a typical good evening of observing.

A section about deep sky names proved quite useful; there are at least three dozen designations in common use today. Along with the familiar M (about one hundred Messier Objects) and NGC (New General Catalog), you’ll find defined everything from Abell (George Abell, planetary nebulae) to Westr (Westerlund, open clusters). Further, Coe lists “other names” for deep sky objects, since any one may have two or more names (NGC 6445 is also PK8-31, and H II 586). This is, as they say, “useful stuff.”

The 169 figures include dozens of photographs and sketches of each deep space object, with finding charts and detailed commentary, and extremely useful information on how the same objects appear under different magnifications.
You'll see photographs of home made and store-bought telescopes, including just about the largest mobile telescope I've ever seen (a 36-inch f/5 monster). Apparently, amateur astronomers who own and use one-meter diameter telescopes have been around for some time. As one who works at an observatory with two 40-inch telescopes, I'm astonished.

One definitely feels the author and his friends have painstakingly gathered all the information personally, from years of observing. I recommend the book highly – but let's get that index in future editions!


Reviewed by John Mosley, Griffith Observatory, Los Angeles, California, USA.

In the September 1999 issue of the *Planetarian* I reviewed the book *The Monthly Sky Guide* by Ian Ridpath and Wil Tirion, published by the Cambridge University Press. I enthusiastically endorsed the slim volume as an essential sky guide for novice astronomers that should have a place in every planetarium bookstore. Now, on this side of the ocean, the Princeton University Press has released the 3rd edition of by the Ridpath/Tirion team of *Stars and Planets*. At an even 400 pages it is a first-class pocket field guide to the sky and it too belongs in every planetarium gift shop.

"... it is a first-class pocket field guide to the sky and it too belongs in every planetarium gift shop."

*Stars and Planets* is a heavily-illustrated introductory astronomy text and a field guide with abundant maps and charts. The text sections, which fill 150 pages, summarize nicely what is known about each planet, the sun and moon, stars, the Milky Way, galaxies, and telescopes, with abundant side-bars, and it is a very readable up-to-date review of basic astronomy.

The heart of the book is a concise observer's guide to the sky. Two charts show the entire sky, 12 double-page charts show monthly views, and 88 charts detail each constellation. The charts, by Wil Tirion, are what we would expect of this master of celestial cartography; they are uncluttered, easy to read, and compress many (but not too many!) objects in a small space. White stars and lines appear on a light blue background with lettering in black. The key is at the bottom of each page. Their appearance is much better than Tirion's crowded b/w charts which appear in the Peterson Field Guide *Stars and Planets* and infinitely better than dense photographs of the sky that have appeared elsewhere.

Descriptions of interesting objects for binoculars and small telescopes accompany the charts, and the text and charts combined fill 240 pages. Two random examples from Cassiopeia on page 108 are:

"ν Cas, 1h 26m +68.1°, 193 l.y. away, is a mag. 4.7 orange giant star with a wide 9"-mag. companion visible in a small telescope. High powers reveal that this companion is itself a close binary."

"M52 (NGC7634), 23h 24m +61.6°, is an open cluster of about 100 stars, 5200 l.y. away, visible as a misty patch in binoculars. It is somewhat kidney-shaped, with an 8"-mag. orange star embedded at one edge, like a poorer version of the celebrated Wild Duck Cluster (M11 in Scutum). M52 can be resolved into stars with 75mm aperture."

Twelve pages of graphics are devoted to the moon (6 Tirion maps and 6 photos of the matching areas), plus photographs. The planets paths among the stars are plotted, but through 2005 only. This is my only criticism of the book - at the cost of a few extra pages the planets should have been shown through at least 2010 or 2015.

It's a very nicely produced book, and I may carry it myself on my next vacation when my only star-gazing equipment is binoculars.


Reviewed by Terry Johnson, Conway, Arkansas, USA.

I have always heard that with a good map, you can go wherever you want. With a good sky atlas then, you would expect to be able to find your way to any place in the night sky. But how many times have you been out with your atlas of choice and wished you could quickly reference more information about a particular open cluster or reflection nebula - information that most sky atlases do not index very well or sometimes leave out altogether? Even with a great map, like Wil Tirion's *Sky Atlas 2000.0*, I often wish I knew more about the area I had wandered into without having to look it up later.

*Sky Atlas 2000.0 Companion* fills that gap beautifully. A comprehensive guide to all 2,700 star clusters, nebulae, and galaxies plotted in *Sky Atlas 2000.0*, 2nd edition, this book provides useful information such as object type, celestial coordinates, angular size, apparent brightness, and distance. A descriptive paragraph accompanies each entry, including comments by renowned observers for many of the better-known objects.

The book is laid out quite logically, with objects listed in alphabetical order (M45 is listed before Pleiades) and by order of *Sky Atlas 2000.0* chart number. Each object is cross-referenced to all common names for which it might be known, making any entry only two page flips away. There seems to be no real logic to which name the authors chose to associate the information, however. For instance, the description for M45 is listed under Pleiades, but you'll find the description for the Cat's Eye Nebula under NGC 6543. Still, the fact that each of these names is listed in the main directory makes things much easier to find than in some catalogues I have used. The print is large enough to read comfortably and there is a nice primer in the front, but I would hesitate taking it out in the open at night since the dew will ruin the pages.

"Carry it along to star parties for a quick reference or use it while planning an evening of serious observing. Either way, this book promises to be useful every time you want to look at something new."

*Sky Atlas 2000.0 Companion* is meant to work in conjunction with Wil Tirion's *Sky Atlas 2000.0*, but I found the information within capable of standing on its own. You can use it with any set of star maps to hop your way to the objects or with a computer-controlled drive. Carry it along to star parties for a quick reference or use it while planning an evening of serious observing. Either way, this book promises to be useful every time you want to look at something new.

Reviewed by Tony Fairall, Department of Astronomy, University of Cape Town, and Planetarium, South African Museum, Cape Town, South Africa.

John Barrow is professor of astronomy and director of the astronomy Centre at the University of Sussex. He enjoys a reputation, as both a researcher in cosmology, and as a populariser of the subject. Suffice to say that he has in the past been summoned to Downing Street to brief the British cabinet on matters cosmological. He has authored a number of books.

The present work is a collection of his essays. They appeared, over the past twenty years, as articles in news journals such as The Observer, The Times Higher Education Supplement and The Daily Telegraph (all being amongst the most respected icons of British journalism). There are 42 essays in all, which the author has organised into ten sections, and for each he provides an introductory commentary. Some of the essays are reviews of new books, but set in an essay format, with ample background provided and amplified.

"This is quality reading, but not necessarily light going. The author analyses and questions modern developments in physics and cosmology, with a great deal of philosophy thrown in."

This is quality reading, but not necessarily light going. The author analyses and questions modern developments in physics and cosmology, with a great deal of philosophy thrown in. It is an assessment of our current knowledge and the ongoing search for better and better theories to describe nature, as things stand at the close of the 20th century.

The intellectual standards are set high, both of those the author and those expected of the reader. This is not an easy-read insight into cosmology, as the cartoon of the front cover might initially suggest. I often found sentences long and needed to read them a second time to get the meaning. Some of the arguments needed a lot of concentration to follow. But this is not to distract from the obvious brilliance of the texts. There are also plenty of stories, analogues and entertaining quotes to lighten the way. Some are real gems, like 'time being God's way of stopping everything from happening at once.' Ingram Pinn's delightful cartoons also provide light relief.

Much of the text is explanatory in nature. Occasionally, as each essay was written as a 'stand alone', there is considerable repetition when reading cover to cover, though given the complexity of the topics, that is often not a bad thing.

The book starts by looking at science writing, giving advice and discussing the matters such as the use of analogies. It then moves on to life in the universe, showing - inter alia - how living creatures and DNA molecules all fit on a linear relationship of logarithmic mass and size with stars, galaxies and even the observable universe. Then on to theories of everything, the great hope of physicists in unifying the way nature works. After which "Why is the universe mathematical?", an assessment of the success mathematics has scored in understanding its ways. From there to philosophical discussions of simplicity and complexity.

Art and music follow as a pleasant diversion, with delightful titles such as the "Survival of the Artiest". Then back into cosmology for the nature of time. Interpretations of the quantum theory perhaps provide the greatest philosophical challenge, and, not surprisingly, religion and science follow. The book ends with cosmology, with articles on the geometry of space and the interpretations of what the COBE satellite revealed.

A lot of ground is covered. It is a book for those with serious interests in cosmology and the theories of physics.


Reviewed by Richard Dreiser, Yerkes Observatory, Lake Geneva, Wisconsin, USA.

Eighteen amateur and professional astronomers, including Sir Patrick Moore, are brought together in this, the third of sixteen titles in the Practical Astronomy Series, which includes Deep Sky Observing by Stephen R. Coe (see review above).

For centuries, amateur and professional astronomers painstakingly studied the universe. Spurred on by Edwin Hubble and others' discoveries (galaxies are island universes far beyond the realm of the Milky Way, the universe is expanding, stars burn by nuclear fusion, etc.) professional astronomers for a time abandoned the insignificant solar system with its ho-hum Sun and blury planets.

Increasingly bigger telescopes and new technologies (photographic film, image tube multipliers, and charge-coupled devices) along with new ways of observing the universe (infrared, radio, and ultraviolet detectors) provided professionals with ways of gathering hundreds of times more information than with traditional methods, and in less time. Computers provided the means to reduce or analyze the data.

Astronomers once spent hours "looking" through telescopes, using their eyes and brain to remember and interpret fleeting clear images. The best astronomers trained themselves, developing observing skills and the ability to sketch what photography could not capture. Edward E. Barnard at Lick and Yerkes Observatories sketched real Martian volcanoes in their proper places years before spacecraft confirmed the same details.

Improved, cheaper, and larger telescopes would eventually become available to mere amateurs, but amateurs never quite abandoned methods once common to all astronomers.

So, here is The Observational Amateur Astronomer, designed with the intent of elevating amateur methods. Here in first chapter, one learns how to safely observe the Sun in visible light. Chapter two explains how to observe in h-alpha. Eclipses, lunar and solar, make up chapter three. Chapter four covers the Moon in depth, and the next five chapters provide information for observing the planets Mercury through Saturn, with plenty of good advice.

By joining an organization "such as the British Astronomical Association or the Association of Lunar and Planetary Observers," the amateur's results may be combined with those of other observers, the authors note.

About a dozen pages are devoted to the asteroids, from locating them to studying their light curves and determining their shapes and rotations. That the size and shape of an asteroid can be determined when an asteroid occults (eclipses) a star never ceases to fill me with astonishment. "Occultations provides the most precise information about the about the sizes and shapes of asteroids," (page 136, paragraph 6).

Accurate predictions are possible only hours before such an event. Amateurs rush
out into what could be a farmer's field, line up along the predicted path of "totality," and attempt to measure the dimming of starlight as the asteroid slips along. Each observer records the precise beginning and ending of the occultation. Since most professionals are pinned down to specific observatories, this is something I think that only groups of amateurs have attempted.

"The Observational Amateur Astronomer is the best overall guide to the varieties of amateur observing that I've ever come across."

Chapter ten is devoted to meteors, sudden streaks of light in the sky. Here, amateur observations may prove valuable, chiefly naked-eye visual watches to determine meteor rates. "The practice of visual meteor plotting, a mainstay of amateur work up to the 1950s, has now been abandoned in view of the greater positional accuracy attainable by photography," (page 147, paragraph 2). A detailed section on photography provides precise information on capturing such meteors during showers (and randomly).

Chapter eleven covers comets, those highly unpredictable objects, which nevertheless, seem to result in a dozen or so "comets of the century" about every one hundred years! "Around twenty comets are usually discovered or recorded each year; of these, perhaps four will come within the range of amateur instruments," (page 159, paragraph one). Once or twice a decade we may be treated to naked eye comets (for instance Ira-Irakai-Alcock, Hyakutake, Hale-Bopp, and Linear in the last twenty years). The chapter includes information for beginning to advanced observers, with useful tips on observing, photographing, and hunting comets.

Chapter twelve discusses planetary and lunar occultations, while chapter thirteen covers two reasonably uncommon atmospheric effects, aurora and noctilucent clouds. There is up-to-date information on aurora and the "compilation of data and statistics on Noctilucent Clouds (NLC) is almost wholly in the hands of amateurs ..." (page 205, paragraph three). In this chapter you'll find excellent suggestions on how to observe and record both auroral and NLC activity.

Chapter fourteen covers variable stars. As with most other chapters, useful names and addresses of organizations such as the American Association of Variable Star Observers are included.

"Most novae are discovered by amateurs, a large proportion of comets are found by amateurs, many minor planets (asteroids) have recently been discovered by amateurs -- and yet, the number of supernovae discovered by amateurs is still very small." So begins chapter fifteen. Why this is true is something of a mystery. Here, methods of discovery are discussed.

Chapter sixteen covers artificial satellite observing in detail, although anyone with access to the World Wide Web can find dozens of satellites visible from any location at the excellent web site http://heavens-above.com. "The Observational Amateur Astronomer is the best overall guide to the varieties of amateur observing that I've ever come across. Not all amateur astronomers started as amateurs. Any bright twelve-year-old may become hooked on astronomy just by leafing through this book. It is intended for those amateurs who can spend time doing real observing, those from whom major discoveries will continue to be made."
NEW!
Images of the Infinite
Since its deployment from the space shuttle Discovery on April 25, 1990, the Hubble Space Telescope (HST) has provided us with spectacular awe-inspiring images and has enriched our understanding of the Universe. This sky show highlights the history and top science findings of the telescope, as well as taking audiences on an unforgettable tour through the Solar System, Milky Way Galaxy, and to the limits of the visible Universe!
30 minutes / 200 slides / $895 for show kit with video on laser disc / $795 for show kit without laser disc

NEW!
Spirits from the Sky: Thunder on the Land
Providing a never-before-seen journey into the culture of the Skidi Pawnee Native American Nation, this sky show produced in cooperation with the Skidi Band, will explore the cultural philosophy of patterning their lives from the observations they made of the Earth and celestial phenomena. This show is funded in part by a grant from the National Science Foundation.
37 minutes / 386 slides / $475 for show kit

Clouds of Fire: The Origin of Stars
Exploring the interconnection of all matter in the Universe, this sky show presents an overview of star formation and the modern instruments which help us gain a clearer picture of stellar life cycles.
33 minutes / 266 slides / $795 with laser disc / $695 without laser disc

In Search of New Worlds
Posing the age-old question of “Are we alone in the Universe?” this show utilizes special effects, computer animations and interviews with planet hunter Geoff Marcy to offer a comprehensive look at the search for planets beyond our own solar system.
33 minutes / 217 slides / $595 with laser disc / $495 without laser disc

Seeing the Invisible Universe
Narrated by Bill Kurtis, host of the successful PBS series “The New Explorers,” this sky show explores the amazing discoveries in wavelengths beyond the range of human perception. Highlighting the Gamma Ray Observatory, the show features interviews and computer animations.
33 minutes / 232 slides / $295 with laser disc / $250 without laser disc

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What’s New

Jim Manning
Taylor Planetarium
Museum of the Rockies
Montana State University
Bozeman, Montana USA

As I write this in mid-July, Mars Odyssey is just over half-way to Mars in terms of its 200-day space flight, the Red Planet still shines brightly between Scorpius and Sagittarius, and the biggest dust storm in 25 years is raging around the planet, making it even more difficult to make out features for northern-hemisphere dwellers who must already look through too much of our own atmosphere to get a steady view. (Can we hear the Mars-favored southern-hemisphere dwellers chuckling?)

But if all continues to go well, the spacecraft is now less than a month, as you read, from its destination, and there may be more news from Mars once the craft settles into its work orbit. Let’s hope the Mars jinx stays away. In the meantime, it’s not too late - it’s never too late - to indulge ourselves in Mars accouterments, a few more of which lead off this quarter’s column.

MarsQuest

If you’ve a mind to run a good, basic Mars show, you can’t do better than Loch Ness Productions’ new, improved, updated, re-rendered Mars program called “MarsQuest,” initially produced in partnership with the Space Science Institute of Boulder, Colorado USA to complement the Institute’s National Science Foundation-funded exhibit of the same name. It’s now available separately from the exhibit for planetariums in general, and it’s a fine show indeed to have in your arsenal.

The program is designed to succeed Loch Ness’ original program “The Mars Show” produced in 1988, and considering how much has changed since then in the field of Martian discovery and speculation, the updated version is most welcome. The show retains some of the elements of the original show, including the fanciful historical beginning mostly intact, and the feel and style of the fanciful ending still present but with much new imagery and specifics. In between lies largely redone territory, with a current study of the planet as we know it from past and recent space missions. The program makes excellent use of images and findings from the Hubble Space Telescope and the Viking, Pathfinder, and Mars Global Surveyor missions, interweaving them in many cases along with original art to tell a seamless story of our awakening understanding of the planet, and growing evidence that its geologic past was more similar to Earth than previously thought - and was laced with water besides. The Martian meteorites - and their tantalizing if controversial evidence that microbial life may once have arisen on the Red Planet - are not forgotten and are handled very appropriately.

I’ve had an opportunity to review the show package, and found myself as impressed with the new show as I was with the old. The imagery is mostly new and very current, the writing is crisp and well-suited to the elegant narration of Patrick Stewart (formerly Captain Picard of Star Trek: The Next Generation), and the pleasing musical score is similar to the original show and complements the other audiovisual elements very well. I’m among those who think that the original program is one of the best things Loch Ness has produced, and the new program is a worthy successor. Even if you have the original, the new show is worth getting to give your audiences the very latest view of this most fascinating of the other planets, in a decidedly pleasant and professionally-done package. I give it four stars.

The cost of “MarsQuest” is $1,995 U.S. and includes the soundtrack (in most any format you can envision), script, nearly 300 individual slides and 21 “multi-images” (read partial pans), extensive production notes, and a video to give you a sense of how the Nessies recommend you present it to best effect. For more (and complete) information, including a copy of the licensing agreement, check out the Nessie web site at <www.lochness.com/shows/mq/mq.html>.

Even as Mars recedes and fades, the Odyssey spacecraft, the continuing work of Mars Global Surveyor, and continued rants over the Martian meteorites should keep the Red Planet in the news and your audiences receptive. Check out this program; it’s a satisfying Mars fix.

Mars Items

The latest edition of the catalog of the Astronomical Society of the Pacific (ASP), 390 Ashton Avenue, San Francisco, California 94112 USA, telephone 1-800-335-2624 (+1-415-337-2624 outside the U.S.), fax +1-415-841-9785, web site <www.aspky.org>, adds some new Mars items, including a new edition of its Mars Globe, 12 inches (30.5 cm) in diameter and bearing 140 names of features. The cost is $99.95 U.S. Also new is the book on the history of Mars investigations called Mars: The Lure of the Red Planet, by William Sheehan and James O’Meara, selling for $27.00 U.S. The planet also figures in slides sets, posters, and other items.

The catalog in general is a treasure-trove of useful space things for people like us, to have or to sell in our gift shops. For the latest catalog, contact ASP as given above, and enjoy.

Assorted Readables

In recent months I’ve collected an assortment of interesting book titles, not all brand new, but new to me, and perhaps new to you as well.

Keepers of the Night by Michael J. Caduto and Joseph Bruchac (ISBN 1-55591-177-3) is available through Fulcrum Publishing, 350 Indiana Street, Suite 50, Golden, Colorado 80401 USA, telephone 800-992-2908, and it follows the format of their earlier Keepers of the Earth book which uses Native American stories to introduce environmental concepts and activities for children. In this more recent volume, Native American stories introduce concepts and ideas about the night sky and the night in general.

For example, the Onondaga story of the Seven Star Dancers who became the Pleiades, and the Dine (Navajo) story of the creation of the moon lead to discussions of the stars and moon, sky phenomena such as the auroa, and concepts such as night and day, leading further to a series of activities ranging from stargazing to creating constellations and demonstrating the phases of the moon. But there’s also an Anishinabe (Ojibway or Chippewa) story about how the bat came to be - which introduces the notion of nocturnal animal activity and the sensory night, and proposes activities such as observing nighttime animal behavior and taking a walk at night to explore how the night changes our sensory awareness of our surroundings.

It’s a wonderful interdisciplinary approach to the exploration of all things nocturnal, with much useful guiding information on how to approach assorted topics with kids and how to make best use of the examples and exercises. It’s a great book to have to get ideas for activities and approaches in our public education, and would be especially useful for the ever-increasing museum “sleep-overs,” especially if you have access to a safe natural area at night. The printed cost is $15.95 U.S.; it wholesales for about $8.00.

3362, web site <www.dk.com>, is a pocket-sized book filled with useful bits of information on the universe, including galaxies, stars, the solar system, a bit of history, and a bit on how we study space. It's very nicely illustrated and concisely written at a popular language level, and makes a good layman's reference.

Alas, any book copyrighted in 1995 is bound to have a bit of a currentness problem in the fast-changing realm of space, and thus the universe is 15 billion years old when we seem to be edging closer the twelve, the Andromeda Galaxy is still 2.2 million light years away when it now seems closer to three million, and Jupiter still has 16 moons. But these are forgivable and inevitable datenesses as the study of space marches on. Although I would wish for better and more useable constellation star maps (for which the book is not very useful) it looks to me to be a good, smart, reliable reference on all general fronts, and packs a lot of facts and concepts into its 150 or so small pages. It retails for an affordable $6.95 U.S.; you can get it wholesale for about $3.50.

Wishing on a Star by Fran Lee (ISBN 1-56865-029-6), published by Gibbs Smith, P.O. Box 667, Layton, Utah 84041 USA, telephone +1-801-544-9800, web site <www.gibbs-smith.com>, is a delightful and brightly illustrated introduction to the constellations for ages six and up. It focuses on major northern hemisphere constellations, introducing each with a story (mostly the Greek legends but with a few other cultures included), followed by a way to find it in the sky, followed by a clever constellation activity. Activities range from making your own versions of the constellation with glow-in-the-dark stars, to making constellation mobiles, to making constellation projections using paper bags and flashlights, to acting out constellation myths, to creating constellation thamato­ropes (those little cards on strings that you can twirl so that the images on each side of the card - say, a horse on one side and wings on the other - combine to form a single picture - Pegasus.) And of course, stargazing is an encouraged activity, with basic tips for doing so.

It's quite charming and well done, and should appeal to the younger stargazing set, and offers many cloudy-night activities to keep interest in constellations going. It sells for $9.95 U.S. retail, about $5.50 wholesale.

Seeing Stars by Barbara Seiger (ISBN 0-448-40198-3), published by Grosset & Dunlap, Inc. by Putnam Publishers, 1 Grosset Drive, Kirkwood, New York 13795 USA, telephone 800-847-5515, covers the major constellations visible from the northern hemisphere, providing sketches and brief information (and sometimes myths) about each. Also included is a full-color star map in poster form giving the basic patterns with figures drawn about them, plus a sheet of 400 stick-on glow-in-the-dark stars to place on the poster.

While attractive enough, I have three quibbles with this one. First, it gives instructions to place the largest stick-on star over the North Star position, which may reinforce the mistaken impression some people have already that the North Star is supposed to be the biggest and brightest star in the sky. Second, many of the star patterns on the poster (and some in the book) are only approximately correct in shape. It somewhat defeats the purpose, for example, when the sword stars of Orion appear in the right side of the star pattern instead of the left on the star-map poster. And third, the book ends with a discussion of the zodiac which includes a non-judgmental statement that astrologers believe that the day you were born determines which constellation is your "sign," and that they further believe that your sign "can tell a lot about what kind of person you are" - offering no further quantification. Further, a list of characteristics allegedly associated with the zodiac signs is given. While it may be of novel interest to know that I, as a Libra, am "friendly and peaceful," it makes me want to declare war to see astronomy and astrology mixed in the same publication in this manner.

Just my opinion, folks; decide for yourself. The poster is attractive, and the stories are simply told. If interested, contact the publisher to check out this book. It retails for $9.99 U.S., wholesale for about $5.00.

"One Giant Leap" by Dana Meachen Rau (ISBN 1-56899-344-7) offers an interesting retrospective on the first Apollo moon landing for older children by telling the story of a kid visiting the Air & Space Museum in Washington, D.C. who imagines himself as Neil Armstrong on the first moon landing mission in 1969. Nicely illustrated and quite true to the facts, it's a little pricier than the others at $17.50 U.S. retail, $9.00 wholesale. Our supplier is Danson Sales, telephone +1-303-904-6011. Nice illustrations, nice concept to get kids thinking in a "you are there" fashion.

Assorted Items

Here are a few items that would be great for your gift shop shelves.

First Light Astronomy Kit from the David Chandler Company, P.O. Box 999, Springfield, California 93265 USA, telephone +1-559-539-0900, is a first-rate starter kit for exploring the backyard universe, and it holds a number of David Chandler products stuffed into an attractive folder. You'll find his Sky Atlas for Small Telescopes and Binoculars publication (mentioned in a previous column), chock-full of introductory information, star maps, finder charts, and data on a number of deep-sky objects organized by constellation. You'll also find his excellent Exploring the Night Sky with Binoculars booklet, a great primer with lots of pictures, diagrams, finder charts for binocular objects, and basic information. There's also a copy of his two-sided planisphere, a master copy of an observing log sheet with comet and meteor information on the back, a three-year moon phase calendar, and a three-year planet locator. Great stuff all. Wholesale price is about $15.

Magnetic Space Adventure is a spacey play set of 16 punch-out magnetic pieces - astronauts, alien creatures, space ships, rovers, space cities all in semi-cartoon style - that can be placed on, moved, and slid about a fold-open space landscape to create various space scenes. The "playboard" looks and feels like cardboard, but will hold the flat magnet pieces. Designed for ages 3 and up (and presumably non-toxic), its cute, colorful, durable, comes in a reusable storage pouch, and would travel well. The item is produced by a company called Smethport Specialty Company, 1 Magnetic Avenue, Smethport, Pennsylvania 16749 USA, telephone 800-473-1240. Wholesale price is about $4.35.

Celestial Planisphere Puzzle from the Great American Puzzle Factory, P.O. Box 40000, Dept. 126, Hartford, Connecticut 06151 USA, web site <greatamericanpuzzle.com>, is a 1,000-plus piece puzzle of the sky in "figure-eight" star map format (that is, with the two hemispheres of the sky positioned side by side, connected at Orion). The background is black, the stars are white, the connecting lines are red, and the line-drawing figures superimposed are light blue. There are various tables and diagrams (of the solar system and Milky Way Galaxy) about the perimeter. It looks challenging and fun if you're into puzzles, and you definitely have an advantage if you know your constellations. And if you're really up for a challenge, assemble it with the lights off, for it glows in the dark.

When you're done, you have a nice educational piece, and the puzzle comes with a 32-page booklet to reinforce this idea. The booklet is a nice little astronomy primer, including sections on the celestial sphere and its reference points and circles, coordinates, cartography (including a brief history of the evolution of celestial cartography), constellations, stars, nebulae, and galaxies,
At the 2000 meeting in Montreal, the IPS organized the Education Committee, which then had its first meeting. Members from all over the world have signed on to what proves to be one of the most active groups in the organization. Already, several different projects are in the works, including the following:

- A Focus on Education column for each issue of the Planetarian. Co-Editors for this are Kathy Michaels and Francine Jackson, with Marie Radbo as the European Correspondent. Contributions for this column can be sent to Kathy Michaels at Kmichael@adelphia.net
- Online lessons. Brock Schroeder is the Project Chair. These would include astronomy lessons that could be used before, during, or after a planetarium visit. Contributions can be sent to Brock at Bschroed@olivet.edu
- Astronomy web sites. Jon Elvert is Project Chair. Contributions for astronomy-related web sites can be sent to Jon at jelvert@lane.k12.or.us

At present, the members of the Committee include: Gary Sampson (Chair), Chris Jenssen, Dale Smith, John Radzilowicz, Brock Schroeder, Lee Ann Hennig, Shawn Laatsch, April Whitt, Ken Wilson, Francine Jackson, Kathy Michaels, Holger Haug, Jon Elvert, R. Subramanian, Marie Radbo, and David Menke. All IPS members are encouraged to be a part of this Committee and/or share their astronomy resources in a spirit of international cooperation. For more information on the Committee, contact Chair Gary Sampson at Ges@execpc.com.

At the first meeting in Montreal, longtime members recalled that there had, at one time, been an Education column in the Planetarian, and that a good project would be to resurrect it, to encourage the sharing of educational issues among the world's planetariums. Included in this column will be the latest news in educational reform related to the field. This will be led by Kathy Michaels, who as a planetarian and classroom teacher, has had to stay on the cutting edge of curriculum standards. Also, Education Committees in the various affiliates will be invited to share their programs and insights. In addition, any other relevant education issues will be addressed.

As the first example of a regional Education Committee, we'd like to introduce the MAPS Education Committee. Begun in 1991, there are about a dozen members, covering most states in the MAPS region. Each year, at the annual meetings we present a forum or discussion, with topics as diverse as whether the profession and its members should be certifiable, to the “proper” and varied ways to make a classroom comet demonstration. At the 2000 meeting, the Committee announced a long-term goal of collecting star stories from all over the world, with emphasis on those that could quite possibly become lost due to the lack of the continuation of oral tradition within a culture. We are hoping to create a “star lore” bank, similar to the script and lesson plan banks. Also, as a result of some of its members having visited Sri Lanka in March, 2001, the Committee is researching the possible methods of transporting educational materials there to help feed the unbelievable desire for education witnessed by all who visited there.

Anyone wishing to contribute to these projects can contact any of the Committee members: Lonny Ruinis, in New Jersey; Alan Davenport, Maine; Arnie Gallagher, New Jersey; Noreen Grice, Massachusetts; Lee Ann Hennig, Virginia; Jim Hart, Maryland; Francine Jackson, Rhode Island; Shawn Laatsch, Maryland; Dave Manass, Virginia; and Kathy Michaels, from New York.

In March of 2001, about 3 dozen educators accepted the invitation to spend a week in Sri Lanka, enjoying the beauty and diversity of the country and learning of the unbelievable desire for education in the country’s children and their teachers. In the next Focus on Education, some of those who traveled there will give their impressions of the time spent there.

For information on other maps (they’ve got some on the solar system as well), you can contact National Geographic at 1-888-CALL-NGS or at P.O. Box 11650, Des Moines, Iowa 50350 USA, or can explore the web site at <www.nationalgeographic.com>.

Finally ...

That’s it for this time. Enjoy the equinox, go out and use “thaumatrope” three times in a sentence, and remember to let me know, as always, what’s new!
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Gone but not forgotten

I missed my deadline last issue. I’ll blame it on the fact that we hosted the Middle Atlantic Planetarium Society Conference from May 9-12, 2001. With over 150 delegates from four continents, I am told that the conference was a smashing success. Four days of museum hopping, talks, demos, and shows are now just a blur. One program of note was a performance of Space Stories, a musical memoir, delivered by Astronaut Story Musgrave with music by Jonn Serrie. Many folks marveled at the inspirational lift they got from hearing Story’s story of repairing the Hubble Space Telescope! You’ll now understand why I included the top ten lists below that I know many of you have read before on Dome-L. Much of the material in this column is culled from that list serve, but if you have news that you would like to see here, please send it to me at the address above and I’ll be happy to include it for you.

You will be missed ...

Jane Hastings (Jefferson Planetarium at Richmond Public Schools, Richmond, Virginia) and her husband Hastings (Starlab Planetarium at the Mathematics and Science Center, Richmond, Virginia) both retired at the end of the 2001 school year. Asked if she was going to continue with “Jane’s Corner,” Jane seemed to think she would be too out of touch to continue it. We suggest that that doesn’t have to be the case, but we’ll just have to wait and see.

Congratulations
... to the Astronomy In Japan website, http://www2.gol.com/users/stever/jastro.html.

This non-commercial, award-winning resource for everything astronomical in Japan is the work of Steve Renshaw and Saori Ibara. Based out of the Kanda University of International Studies in Chiba, Japan, this website will give you plenty to ponder and explore!

... to Lou Lebige (Technical Customer Support at Sky Skan, Inc. in Nashua, New Hampshire) recently announced his engagement to Donna Maslowsk; they plan to wed in February 2002!

... to Noreen Grice (Charles Hayden Planetarium at the Museum of Science in Boston, Massachusetts) on her contribution to the book, Touch the Universe: A NASA Braille Book of Astronomy. The book contains three-dimensional representations of Hubble Space Telescope images! The book was created through the use of a $10,000 Hubble Space Telescope grant for education programs. For more information on the book, go to http://analyzer.depaul.edu/1tu.

... to the Griffith Observatory on their recent gift of $1 million from actor Leonard Nimoy and his wife Susan Nimoy towards their renovation and expansion project. Nimoy is best known for his Emmy-nominated role as Mr. Spock in the television and film versions of Star Trek. The gift will go towards the development of a new lecture hall to be called The Leonard Nimoy Event Horizon. The couple hopes that their contribution will get others involved in the project. It does get any cooler than that (jph)! Go to http://www.GriffithObs.org/nimoy.html for the whole story.


... to Dionysios (Dennis) Simopoulos (Director of the Eugenides Planetarium in Athens, Greece) on the occasion of the groundbreaking ceremony for his new facility, scheduled to open in October 2003! Their design team undertook an exhaustive fact-finding mission that included visits to 32 planetaria, space theaters, and science centers in 12 cities in Europe and North America. The New Eugenides Planetarium is planning to install a Digistar 2 projector, 15/70 large format film equipment, interactive audience control system, full dome video, laser projection systems, and an extensive interactive exhibit hall, whoa!

People on the Move

Shawn Laatsch (formerly with the Arthur Storer Planetarium in Prince Frederick, Maryland) is now Director of the Rauch Planetarium in the Gheens Science Hall at the University of Louisville, Louisville, Kentucky. Visit his new facility at their website www.louisville.edu/planetarium.

Drew Gilmore joined the team at Sudekum Planetarium in Nashville, Tennessee. In addition to his skills as a planetarium educator, Drew also brought along his knowledge of web site design. Check out his work at www.sudekumplanetarium.com.

Leslie Bochenski (formerly of the Hopkins Planetarium in Roanoke, Virginia) has been named Director of the Aldrin Planetarium in West Palm Beach. She replaced Eric Landstrom who is now an educator with NASA.

Amanda Rainwater is the new Director of the Inglesmoor High School Planetarium in Bothell, Washington. She replaced Cheri Dracobly who returned to classroom teaching.

Chuck Winrich is leaving his position as the Planetarium and Observatory Manager for the Schenectady Museum, Schenectady, New York, at the end of July to return to teaching.

Worth Repeating

Steve Tidye (Astronomy Educator at the Alexander Brest Planetarium in Jacksonville, Florida) lends us this list of the “Symptoms of being a Planetarian.” “Ever wondered what are the symptoms of being a planetarian? If you experience any or all of the items on the list below, you may well be one.

1. You have a colorful collection of bruises on both legs. (And they hurt for the longest time).
2. You own a wide and varied collection of hair bands, left behind in your dome by the female of the species. (Because, as my colleague, Sarah, here in Jacksonville, once said, “Chicks are always frizzling with their hair.”)
3. You’re thinking of buying shares in Radio Shack, Home Depot and the company that makes duct tape.
4. You know more than you used to about the geology of terrestrial rocks, having seen so many that the owners claimed were meteorites. (I was shown one recently by a woman who was convinced that it had been intercepted by an angel, and given to her. Hmm, I’ll come back to you on that one ... ).
5. When you get up in a social situation to address an audience, you instinctively want to ask for the lights to be turned off to make you feel at home.
6. When you hear a record on the radio which features in your current laser

Steve Tidye
show, you imagine yourself pulsing the lights in your dome to the music.
7. By the end of each three-month run of a taped show, you can recite virtually word for word the entire script. Which means many of us will still be able to sing "Waltzing With Bears" in our seventies!
8. You will forevermore see Ursa Major as "a shopping cart without the wheels" (Bear Tales).
9. When you tell people you work in a planetarium, they look momentarily puzzled, unsure what that strange word means... until you explain it, and then they're all excited for you. And it makes you feel good.
10. And finally... unlike most other people in other professions, you love your job.

And if that's not enough, here is Steve's list of symptoms of having been to a planetarium conference... "If you experience one or all of the items on the list below, you have recently been to a planetarium conference."
1. You have a craving for Woodchuck cider (for those of us who were at the recent SEPA/GLPA conference).
2. You haven't eaten so well for months.
3. You haven't slept so little in years.
4. You haven't laughed so much since...
5. You (may) come back to your facility that'll last a lifetime.
6. You have another great canvas bag that'll last a lifetime.
7. You can now put faces to names of people you've known of for years. ("Oh, so you're [fill in the blank].")
8. You're envious of the ability of some planetarians to point out the locations of the most obscure constellations and asterisms you struggle with (as evidenced in the Constellation Shootout event).
9. You've spent several days looking at equipment that you either:
   a) go home and buy fairly quickly
   b) already have at your dome
   c) would like to have but know you'll never be able to afford
   d) would like to have and think you will get... in five years.
10. And finally... your mental batteries are recharged to full.

Great Ideas
In response to questions about brightness issues with all-skies after a lamp is changed, Craig MacDougall (Planetarium Coordinator at the Museum of Science & Industry in Tampa, Florida) suggests, "We don't have all-skies but we do have panoramas using Ekta-graphic IIs with EXRs and noticed the same thing. We solved it by simply replacing all the panorama lamps when one goes. The lifetimes of these lamps are pretty consistent, so when one goes it won't be long before the others follow.

Eric Landstrom (NASA JPL Solar System Educator at the Solar System Educators Program) donates this idea for teaching astronomy to the blind. "At a SEPA conference several years ago, I got this great tip. Take a starmap for a constellation (like Orion) or an asterism (like the Big Dipper). Mount the map on foam board at least an inch thick. Then take sewing pins with various sized heads. They are available from your local sewing and notions store. The idea is that just as a brighter magnitude of star is indicated by a larger dot on the star map, you scale it correspondingly as a tactile version for your sight-impaired astronomer. The bigger the dot, the larger the head of pin you use to represent the brighter magnitude stars. You can even indicate nebulas and sections of the Milky Way by using a bit of felt on the board at the appropriate spots!

But how do you explain 'blue' to someone who's never seen colors?

Menahem sighed. "How does one explain colors to a blind man?"

"One says," snapped Eric, "that red is like silk, blue is like cool water, and yellow is like sunshine on the face." - David Gemmell, Legend.

Steve Fenfress (Director of the Strasenburgh Planetarium at the Rochester Museum & Science Center in Rochester, New York) sends this neat trick our way... "Joe Ricci of our technical staff pointed this out to me. Maybe someone else has also hit on the idea. Shine one of those $7 laser pointers through the part of a Zip disk case that has fine ridges. The laser beam diffracts into a plane. Point it at the dome and you have a circle on the celestial sphere. The red line looks good with the stars. Joe has re-wired one of these for remote control; it's on a swell mount in the gallery, so it can be moved and pointed to approximate the next upcoming ISS path, etc."

Have you been to visit Ray Worthy of Stargazer Planetariums in Hartlepool, England? You can find out what Ray has been up to at his website, www.stargazer-planetariums.co.uk. Ray makes custom-built inflatable domes for mobile planetarium shows and other uses.

Chuck Bueter, announced the debut of the Planet Plate Education Website at the 2001 SEPA/GLPA conference in Kentucky. The theme is "The Universe on a Paper Plate" and it can be found on the web at: http://analyzer.depaul.edu/paperplate.

Chuck and his contributors have assembled an impressive list of activities that you can share with your students using a paper plate and lots of creativity. You can email Chuck your contribution at bueter@telocity.com. Chuck is a dynamo of ideas, and I even helped him to create a scale model of Stonehenge made entirely out of Rice Crispy Squares at a past conference in Kalamazoo!

Overheard
The Longway Planetarium, a 183.6-meter (60-foot) dome, in Flint, Michigan is going to install a DigiStar II this summer according to Michael Gardner, Director.
Dr. Tarzadin Ulaanbaatar (lecturer of Astronomy and Geophysics from National University of Mongolia) wants to build the first planetarium in Mongolia, but he needs our help. Contact him with ideas by mail at: Ulaanbaatar-46A, POB 299, Ulaanbaatar, Mongolia or by email: tarzad@yaho.com.

Koriyama Science Center in Koriyama City, Japan, is about to become the tallest planetarium in the world when they open their 23-meter dome on the 23rd floor of a skyscraper. They will have a GOTO Super-Helios star projector, AstroVision large format film system, and the first installation of GOTO's DigiCanvas (half dome video system).

How can I buy a star?
The next time someone calls you to ask if you know how they can adopt a star, give them this web address: http://www.savethechimps.org/space.asp - instead of the usual lecture on why they can't legally buy a star. I know that the voice on the other end of the line will probably ask why they should honor a loved one by sending a donation to an animal shelter, but just visit this site and you'll find out why. I stumbled across this website as you do most of the time, by clicking on a link from a news site. I was attracted by title, Space Chimps, The Forgotten Veterans. As it turns out, the US Air Force wanted to decommission their extensive primate population of test chimpanzees and awarded the contract to relocate them to a research laboratory instead of an animal refuge being created in Florida.

After a lengthy legal battle, the animal refuge finally got the research lab to let them relocate these animal heroes to a life under the sun, instead of behind the bars of a test lab. With this being the summer of the remake of the film The Planet Of The Apes, I thought this would be an appropriate piece of space history to finish off this edition of the Gibbous Gazette. Now, if someone could just liberate the rest of us...
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First, let me thank Martin Ratcliffe, Jon Elvert, and John Mosley for inviting us to contribute a regular column to the Planetarian. We hope to use this space to let you know what's doing in NASA Space Science and Education and Public Outreach, as well as address any questions you may have. This month let's get the background and organizational explanations out of the way and tell you who we are and what we're about.

Each of NASA's five strategic "enterprises" covers a major area of the agency's research and development efforts. The enterprises are Aerospace Technology, Biological and Physical Research, Earth Science, Human Exploration and Development of Space, and Space Science. The mission of the Space Science Enterprise is to solve mysteries of the universe, explore the solar system, discover planets around other stars, search for life beyond Earth from origins to destiny, chart the evolution of the universe and understand its galaxies, stars, planets, and life. (See http://www.nasa.gov for more info about the other enterprises.) The Office of Space Science has four intellectual themes: Search for Origins, Structure and Evolution of the Universe, Exploration of the Solar System, and the Sun-Earth Connection.

The NASA Strategic Plan (http://www.hq.nasa.gov/office/codex/plans.html) mandates that we "partner with the educational community and industry to inspire America's citizenry and create increased learning opportunities," that we "involve the educational community in our endeavors to inspire America's students, create learning opportunities, and enlighten inquisitive minds," and that we "share the experience of expanding the frontiers of air and space with the broadest array of America's citizenry."

Space Science has an extraordinary potential for contributing to these goals. The discoveries and new knowledge from our missions and research programs have engaged people's imaginations, informed teachers, and excited students and the public about science and exploration. To realize this potential, we have established a Science education and public outreach (EPO) "Support Network" (formerly known as the Ecosystem) to make education at all levels and the enhanced public understanding of science integral parts of the Space Science missions and research programs.

In March 1995, NASA's Office of Space Science published Partners in Education: A Strategy for Integrating Education and Public Outreach into NASA's Space Science Programs, the third volume of the Office of Space Science strategic plan. These three volumes reaffirmed "our traditional commitment to carry out a world-class program of scientific research and announce our new commitment to make significant contributions that address larger needs. In particular, this part of our plan responds to national needs to engage the space science community more deliberately and visibly in its inspirational, science-rich, technology-intensive mission to partner with the education community to strengthen science, technology, and mathematics education; to reach out and involve groups which have been historically underrepresented in the space science program; and to enhance public appreciation and understanding of science, mathematics, and technology." This document was followed in October 1996 by Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy. (Both documents are available at http://spacescience.nasa.gov/education/index.html)

Five years later, an incredible number of amazing accomplishments can be claimed, not the least of which has been the growth of an interconnected nationwide network of people in NASA, universities, industry, education, and informal education. OSS put its money where its mouth is by requiring new missions to budget and plan for 1.2% of mission costs (excluding launch vehicle costs) to be spent on education and public outreach. Older missions have carved these amounts out of existing budgets. OSS established a set of review criteria, which include commitment of the science teams to education and public outreach efforts, partnering with other organizations, and reaching out to underserved/underutilized groups, as well as supporting educational reform. In all of this, OSS works closely with NASA's Education Division, led by Frank Owens, to coordinate and integrate activities and programs.

Two important developments for you, the planetarians, are NASA's growing recognition of the wide reach of informal education venues, and the emphasis on collaborating with partners across the country. Our grass-roots effort to provide you a pipeline for the latest news and images, for example, is now seen as a powerful dissemination tool, and more and more people are jumping on the bandwagon by actually planning and budgeting for this effort.

Another valuable development is an online directory of space science educational institutions and materials (http://teachspacescience.stsci.edu/cgi-bin/ssrtopoplex). We are studying the possibility of developing a similar resource for informal education. A major development has been the fruition of a reporting mechanism that was mandated so we can show what our efforts are accomplishing. The first OSS E/PO Annual Report is available at http://ossim.hq.nasa.gov/osepo/

So who are the OSS E/PO network folk? OSS wanted to provide both topical (thematic) and geographic access. A set of four Education and Public Outreach Forums, one for each of the Space Science themes, were conceived and for the most part assigned to the organization with the lead role for the science theme. In addition, a solicitation for regional Brokers/Facilitators resulted in the selection of five organizations across the country who were assigned responsibility to broker and facilitate connections between scientists and educational entities in their geographical regions. The Broker/Facilitator positions have recently been re-competed, and an announcement of the results is expected this summer. The current participants are listed below.

Within the network, there are several cross-cutting working groups, with participants from all themes and all regions. Mary Dussault of Harvard-Smithsonian Astrophysical Observatory is the lead for the Informal Education Working Group. John Stoke and I are members of this group, along with many other folk. We learn from each other, with the goal of serving all of you better. Later this summer we plan to post a website we refer to as "the watering hole," an online place to meet, ask questions, get ideas, ask for help, and offer help with informal education activities and programs.

The quickest way for us to get current information to you is through your list-servers, so until next issue, keep an eye on-Dome-L
Thematic Forums
Point of Contact: Dr. Terry Teays
Phone Number: (410) 338-4733
Email Address: teays@stsci.edu

Structure and Evolution of the Universe
Smithsonian Astrophysical Observatory (SAO)
Point of Contact: Dr. Roy Gould
Phone Number: (617) 496-7689
Email Address: rgould@cfa.harvard.edu

Solar System Exploration
Jet Propulsion Laboratory (JPL)
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Northwest Region
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Email Address: camorrow@colorado.edu

Call for Proposals
The Initiative to Develop Education through Astronomy and Space Science (IDEAS) Grant Program Call for Proposals is now available on the IDEAS Web site at http://ideas.stsci.edu. The deadline for submitting a proposal is Friday, 26 October 2001, 5:00 p.m. EDT.

The IDEAS is a funding opportunity administered by the Space Telescope Science Institute Office of Public Outreach for NASA's Office of Space Science (OSS) that provides modest start-up funding for innovative, creative educational programs featuring active collaboration between astronomers/space scientists and education/informal science professionals. Through this effort, IDEAS aims to enhance science, mathematics and/or technology education in the United States for K-14 students and the general public by promoting partnerships which look for ways to translate astronomy/space science into contexts that will stimulate the interest of students and the general public as well as help them understand the information. The range of funding available through the IDEAS grant program is:
- Up to $20,000 for programs which must be completed within one year; OR
- From $21,000 to $50,000 for more ambitious programs which may require two years to complete.

Any questions or comments can be made through Space Telescope Science Institute Office of Public Outreach at 410-338-4848 or ideas@stsci.edu.

(Birds, continued from page 9)
name comes from the Arabic word for tail. Explain that as the sky darkens, they will easily see the cross-like shape of the Swan and the three stars in a row of the Eagle.

Point out Deneb. Tell the group that although it is the dimmest of the three stars in the triangle, it is very bright. It is about 10,000 times as luminous as our sun, but it is much farther away from us than the other two stars in the triangle. Then point out the star Albireo in the Swan, it marks the beak of the swan. Tell the group that in a small telescope it is really two separate stars. Explain also that in a small telescope one can see the colors of the two separate stars. One is blue and the other is gold. Also, suggest that everyone scan both the Swan and the Eagle constellations with binoculars. They will see many more stars than with the naked eye because both of those constellations are in the band of the Milky Way.

Encourage people in the group to take a look at the Big Dipper while they are outdoors. With your planetarium capability, point out that they can easily see where the Owl Nebula is. It is always right under the bowl of the Dipper toward the front. It is not possible to see it though in the sky without a very good telescope. In that way, the nebula is much like real owls. Often we know where they are, but we cannot see them. (Figure 3). At this point, play a few hoots of owls without any pictures. Point out also the naked eye double star in the handle of the Dipper. Encourage everyone to take a look at it outdoors. Suggest that they use binoculars. Also, show how to use the handle of the Dipper to find Arcturus. Arcturus is a good example of an orange star. Use binoculars to look at it also.

That is the general idea for “The Stars for Bird Lovers” show. I think that anyone who creates the show will find that it is a rewarding and worthwhile endeavor. If someone does a very good job of putting on this show, I think people might just flock to see it!
President’s Message

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Included in the mailing with this issue is a copy of the proceedings of IPS 2000 in Montreal. This fine conference brought together a large number of planetarium delegates from all corners of our small globe. I would like to thank Marc Jobin, astronomer at the Montreal Planetarium, for guiding this publication through to completion. It takes a great deal of effort to produce such a document, and we all owe a debt of gratitude to Marc and the staff at Montreal for their hard work.

This is also the first time that “all” IPS members have received a copy of the proceedings. In the past the proceedings were sent to delegates only as part of the conference fee. Following the policy adopted at the 1999 Council meeting, a copy of conference proceedings will be sent to all members as a benefit of membership. The CD contains an Adobe Acrobat file that you can easily print out yourself if you wish to have a hard copy. (Adobe Acrobat readers are available for free over the internet). Future publications of the proceedings are planned to be distributed in this way, allowing ease of access for most people. It is economical, easy to access with most computers, and is the best use of the limited finances of IPS. However, council also realizes that there will be some who wish to have a hard copy. We have arranged to have a limited number printed by request. Please complete the form at the end of my message (photocopy it) and send to Shawn Laatsch, the IPS Treasurer before November 1, 2001. Shawn will arrange for a copy to be sent to you by the end of the year. I am sorry, but late applications will not be fulfilled for this one time offer. However, spare CDs are available.

One of the great pleasures of being President of IPS is the rare opportunity to be invited to theater openings. Not only is this an opportunity for me to see new theaters, but it also indicates that our profession is alive and well. Through the generosity and kindness of the Verkehrshaus der Schweiss (Swiss Transport Museum), Mr. Daniel Schlup, the Director of the Planetarium in the beautiful city of Lucerne, invited me to speak at their press conference and grand opening. This was indeed a great honor, and I was pleased to bring the congratulations of our membership to the people of Lucerne, and the visionary leaders who have refurbished Switzerland’s only planetarium. The theater had an entirely new dome, seats, and all-dome video system. A Zeiss star projector still stands in the middle of the 18.3 meter (60-foot) diameter planetarium - a fine mix of the old and the new. I know the talented staff at Lucerne will have a wonderful time blending the new technology into their theatrical productions.

At the opening, I also had the great pleasure of meeting some fellow colleagues. Mdm Agnes Acker, the well-known astronomer and President of our French affiliate, attended, as did Herr Holger Haug, our representative from the German speaking planetarium. I was also pleased to meet colleagues from other parts of the world as well.

Lucerne is a fine example of the re-invention of some of our domes that is going on across the world, and I encourage you to take advantage of the fine beauty of the region and go and visit if you have the opportunity.

I am quite sure other planetariums have opened recently that I am not aware of, and to you I also give my congratulations. There appears to be a level of planetarium construction and refurbishment going on at many theaters around the world - a very encouraging sign for our industry and reflective of regional and local commitments to expanding the role of our theaters through the application of new technology.

Astronomy magazine

Earlier this year I was called by Astronomy magazine, one of the main popular level magazines for astronomy in the United States, and asked if anything was happening to our industry beyond the grand opening of the new Hayden Planetarium in New York. One can perhaps forgive the public’s impression that Hayden was the only new planetarium lately. Regional openings would not get the kind of coverage that New York could muster. And so to encourage more visits to regional planetariums, I set about writing an article for Astronomy magazine that highlights the twenty or so theaters that have opened recently, or are about to open, and who have some form of all-dome video system (this is what the editors wanted to hear about). I have been told that the article will run in the October issue, which will be in circulation by the time you read this.

The article is designed to give more people across the country an opportunity to experience the kind of magnificent visualizations that are made possible by the new technology. Those who have seen it will agree that this represents a new step in our industry. I hope the article will be useful for planetarians to show your institutional president or board members. The level of investment that these new and refurbished institutions are ploughing onto their theaters is indicative of a well-founded understanding that they will generate income to be viable operations. This is good news for all of us involved in private institutions that have concerns about budgets and rely on ticket revenues to keep our doors open. I hope the article will provide some material for useful discussion for your own facility.

IPS 2002 Conference

It is now less than a year away from our conference in Morelia, Mexico. I encourage you to read Gabriel Muñoz’ notes regarding the conference elsewhere in this issue. A con-
ference is a great way to make new friends, re-connect with old friends, and build new alliances and collaborations between colleagues. It is also a great way to learn about how different cultures present the subject of astronomy to their audiences. In addition, you get to see parts of the world that you might not otherwise visit, and Mexico has a rich history of astronomy, so begin to make your plans, and we will all meet next summer in Morelia. The conference is set in a very modern conference facility and promises to be the highlight of our year in 2002.

IPS Journal

I have had the opportunity to review some old copies of the Planetarian, and one major thing struck me. While most journals and magazines have undergone redesigns since the 1970s, this Journal has remained essentially the same. I think it is about time we changed our appearance. Your editor, John Mosley agrees. John, myself, and a number of other leading IPS members will be putting our minds together to re-shape your Journal. I cannot tell you how long the process will take at present since we have just begun, but I hope to bring you news of developments over the next year. The size of the magazine will remain essentially the same, but these changes will be an advantage to John who wishes to use more modern printing methods and editing tools that are both more economical and versatile. I also hope that the new look, when it occurs, will encourage more of you to contribute. I encourage you to send me any ideas you might have for a redesign. What do you like and what don’t you like? Are there new columns you would like to see?

IPSNews

As a member of IPS, you will already have heard of the IPSNews service. This email service grew out of a need for IPS to have an electronic way of contacting the membership easily with society news and interesting information, such as relevant news releases. The service is occasional. I would like to thank Christine Shupla at the Dorrance Planetarium in Phoenix, Arizona, U.S.A., for coordinating this effort. I hope that in future the IPSNews will serve to assist in our professional development within our community, and be seen as an additional service of membership. The list of members and email addresses is taken from your most recent subscription documentation that was sent to our Treasurer. If you have not received any of the emails from IPSNews, please send Shawn Laatsch an email note informing us of this, and we will update our records.

By now most of you will have heard about the result of the conference site vote for 2004. Three fine institutions presented appealing venues for our conference, and my thanks to each of them. The result was not known at the time this message went to press but my thanks to all three for bidding for the conference. As your council meets this fall, we will be reviewing bids for the 2004 conference. If you are planning to bid, time is now of the essence, and I encourage you to contact me as soon as you receive this issue to let me know of your intentions to offer a bid.

In October your council will meet for its annual meeting, this time at the historic Vatican Observatory in Italy. This represents the first time in three years that Council has met in Europe. In addition, the writer, astronomer and Jesuit priest, Guy Consolmagno, will be our host at the Vatican Observatory. As curator of one of the world’s finest meteorite collections, Guy, a leading meteorite researcher grew up visiting planetariums in his US homeland and now spends half his time between Italy and the Vatican Observatory in Arizona. Next time I will report on the results of our meeting.

IPS 2000 CONFERENCE PROCEEDINGS ORDER FORM

Please use this form if you want to request a printed copy of the IPS 2000 Conference Proceedings in addition to the CD-ROM copy you have received with this issue of the Planetarian. A limited number of printed copies are available. To use this form, you must be a current individual member of IPS, or your facility must be a current institutional member of IPS.

Name ____________________________________________________________

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Please mail or fax a photocopy of this form to:

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This issue of International News starts with news from South America, contributed by Nicolás Gulino: "The landlocked South American country of Paraguay has joined the world of planetaria thanks to the efforts of amateur astronomer and educator, Blas Servin of Asunción. Mr. Servin is president of the Asociación de Aficionados a la Astronomía del Paraguay (Amateur Astronomers Association of Paraguay) and is well known around the country as an avid astronomy educator and historian. He teaches astronomy classes and leads astronomy clubs at two Asunción schools, Cristo Rey and Dante Alighieri. He is credited for his research on the history of astronomy in Paraguay, most notably that of the Guarani Indians and of the 18th Century Jesuit astronomer, Padre Buenaventura Suárez, the country's first astronomer (whose name the new planetarium bears).

"With the generous help from the Japanese Embassy, Mr. Servin purchased the Goto Ex-3 projector and 5 meter dome. The planetarium is permanently housed in a downtown location that also includes a DVD/video system, slide projector, and various astronomy posters. Since its inauguration on 1 June, the new facility has done its magic by capturing the attention and imagination of hundreds of children and adults.

"The new Buenaventura Suárez planetarium is a dream come true for astronomy education in Paraguay and adds a resounding number to the map of planetaria in South America (Planetarian, Vol. 29, No. 4, December 2000, p. 48). This is significant, as every number will add momentum to the eventual formation of a South American Planetarium Association, an idea strongly advocated by Dale Smith on his visit to the region in August 2000. A major step towards this goal will undoubtedly be the annual meeting of the LIADA or Liga Iberoamericana de Astronomia (Latin American Astronomy League) to be held in Asuncion in October 2001. This organization already brings together educators and planetarians from South America, and it is expected that its members will embrace their host country's new facility, offer to share ideas, and work towards the eventual formation of a regional association for the continent."

The International News column depends heavily on contributions from IPS Affiliate Associations all over the world. Many thanks to Steve Balog, Vadim Belov, Bart Benjamin, Ignacio Castro, John Dickenson, Paul England, Jean-Michel Faidit, John Hare, Shoichi Itoh, Aaron McEuen, Loris Ramponi, Zinaida Sitkova, and Mark Sonntag for your contributions. You are welcome back with new reports, and I look forward to reports from other Associations as well. Upcoming International News deadlines are 1 October for Planetarian 4/01 and 1 January for 1/02.

Association of French-Speaking Planetariums

The show La planète aux mille had its premiere on 18 April; thirty-six planetariums were involved in this production.

The 2001 magazine Planetariums, edited at Planetarium de Montpellier for the seventh year, was presented at the annual meeting of APLF, which this year was held at Planetariums in Milan and Brescia in Italy.

Among notable activities at the time these lines are written, in July, is the creation of F-HOU, a French section of the project Hands on Universe, with the Planetariums and the APLF commission Formation. Agnès Acker at Planetarium de Strasbourg and Anne-Laure Melchior at the Observatory of Paris-Meudon are in charge of the project.

Association of Mexican Planetariums

As complementary news to the XXX AMPAC meeting held at the Cd. Victoria Planetarium, last May, eleven member planetariums were represented. Ing. Gabriel Muñoz, current Director of the Morelia Planetarium and host to the 2002 IPS Conference, took office as AMPAC President for the 2001-2003 term; he was President Elect during the past term. Outgoing President was Ing. José de la Herrán. Ing. Miguel Angel Mota, Rehilete Museum & Planetarium, was elected President elect, Lic. Agustín Pacheco, Director of the Puebla Omnitheater and Planetarium, Secretary, and Captain Fernando Hoyos, Director of the Tampico Nautical School, Treasurer.

They all have plenty of work till next year since the XXXI AMPAC meeting will coincide with the IPS Conference. Muñoz will seek authorization at the next IPS Council meeting in October for AMPAC members to be allowed to attend the Planetarium special shows, perhaps two main lectures and the vendors exhibitions, at a reduced admission price or for free, since for most of them, their institutions will be unable to pay the whole Conference fee and there will be no translations into Spanish at the papers presentations.

Three new traveling planetariums became AMPAC members, two from Matamoros, managed by Roberto Ang, and the third from Fama, where Rafael Barbabosa presents astronomy shows at different schools and sells astronomy related materials, posters, photographs, etc. Dr. Guadalupe Estrada Lepe has been appointed as new Director to the Luis Enrique Erro Planetarium, currently the largest one in Mexico City. Former Director Ing. Miguel Gil Guzmán for almost two decades dedicated much time and work to upgrade the Planetarium, and he will continue teaching engineering at the Politecnical Institute. Ignacio Castro will continue as AMPAC's IPS Affiliate Representative for the present year.

British Associations of Planetariums

The National Space Centre opened on 30 June in Leicester. The £40 Million National Lottery development on an old sewage plant - £25 million was for reclaiming the site! A preview Day of 1000 was held on 16 June. Many exhibits were not complete then, but opening day was a great day out with stunning effects in the Space Theatre. It is going to need a continuous stream of visitors throughout the year to generate the needed operating revenue. Alex and George Barnett and the Space Centre Crew are wished success in the coming months.

In broad terms, the Stargazer dome business appears to be going from strength to strength. The expansion has never been designed by Paul England nor even foreseen as such. It has now come about that all England's domes are being made in a factory in Thirsk in North Yorkshire. Apart from domestic dome business, so far this year he has been on trips to Florida and Finland. In Finland, one of his negative pressure domes has been installed into a theater dedicated to the showing of Aurora programs. It is in the town Muonio up near the Arctic Circle. A similar dome is being installed into a purpose-built planetarium belonging to the Cleveland and Darlington Astronomical Society. If all goes well (it has been delayed by the foot and mouth crisis), it should be.
open this coming November.

Bob Mizon took his Mizar Planetarium to a small village primary school near Tavistock (N. Dartmoor) recently. He said that when he began the first show, a little boy, who couldn’t have been more than about five years old, piped up: “We’re glad you came, ‘cos we can’t see the stars when the vicar turns his lights on ...” This in one of the best dark-sky areas in the south-west. The local church had succumbed to the entreaties of the Church Floodlighting Trust (which curiously has the same address as the Lighting Industry Federation, and spends public money), and lit itself up, like many other churches, for the Millennium in 2000.

The Aberdeen Planetarium continues to run a varied program of shows and events. In the last year they have produced several shows incorporating poetry, music, and drama, which have been performed in the planetarium. The exciting news is that for the first time Aberdeen will have its own mobile planetarium! In conjunction with SATRO North of Scotland and with the financial help of Enterprise Oil they have purchased a state-of-the-art mobile dome which will be launched at Techfest in September this year. They plan to develop a range of shows suitable for the mobile dome with a view to touring schools, science festivals and other events.

The 100-seater At-Bristol Planetarium, sponsored by Orange and called the Orange Imaginarium, is coming up to its first birthday this summer. Oasis in Space has proved a popular family show (some visitors rating it more highly than the IMAX experience), but visitor uptake of tickets for the planetarium has been patchy. The staff is now looking at taking on a greater diversity of shows to increase both the educational and leisure markets. The space theme will be developed across the At-Bristol facilities with Destiny in Space showing in the IMAX theater and practical workshops offered to schools. For more information see <www.at-bristol.org.uk>.

Armagh Planetarium is shut down, and the staff is not sure when they will be able to fully open again. The planetarium is undergoing a review at the moment and it will be on the outcome of the recommendations put forward by that review how and when it will re-open. The staff has recently done a lot of outreach work with local schools and community groups. They got a lot of rewarding feedback and have posted the results at a new website <www.thestardome.co.uk>. The planetarium will be open for family fun days during August, as some of refurbishment work is expected to be completed by then. The Star Theatre will remain closed until its future is reviewed in more detail. The family fun events will include all the usual water rockets and working with paint and clay, attempting to give the small visitors a good day out.

On 15 May, there was an exciting explosion of stellar energy when Island Records chose to launch their new band, allStars at the London Planetarium. The Big Green Dome shook as the band performed to a show created by the planetarium’s own production team for a 300-strong audience of music press, radio and television presenters. The event was a tremendous success and generated a lot of publicity in magazines and interviews. Tussaud’s actually won the Corporate Hospitality Award for the best venue 2000, and the planetarium has helped to launch everything from perfume to dental products.

In 2001, London Planetarium is also doing good business promoting the real thing. Visitor figures are up on last year, with a significant increase in those coming to the planetarium only to see the current public show Wonders of the Universe which is rather different in style from previous ones. And, as well as general visitors, thousands of school children are attending live curriculum presentations. Their enthusiasm alone is evidence of the great and consistent interest out there.

Canadian Council of Science Centres

CCSC members met in Ottawa on 3-4 April as part of the annual Canadian Museums Association Conference. An election of CCSC directors and officers was held, and the following slate was elected for 2001/2002: Jim Marchbank, Science North, President; George Smith, Edmonton Space and Science Centre, Vice President. Bill Peters, Calgary Science Centre, Secretary/Treasurer. Benoit Legare, Montreal Science Centre, Marie MacBeath, Science East, and Bryan Tisdall, Science World, Directors. George Phillips, Fraser-Fort George Regional Museum, Paul Donahue, Canada Science and Technology Museum, Past President.

John Dickenson was appointed by the board to continue as the IPS affiliate representative to sit on IPS Council. Among the many issues discussed at the conference were options for the future structure of CCSC. These include continuing as an all-volunteer organization, or moving towards a paid secretarial or executive staff. In many ways these are similar questions to those facing IPS which IPS President Martin Ratcliffe has outlined in his President’s Message in Planetarium 2/01. Meanwhile CCSC is moving ahead to secure grant funding for a one year position to provide support services to the President and Directors during the implementation period of the CCSC’s strategy to increase the profile and funding of CCSC member science centers and museums with the Federal Government.

CCSC recently held a vote to change its name. Most popular choice was Canadian Association of Science Centres (CASC). Formal adoption of the new name will be presented at the next AGM.

Starlab portable planetarium operators will be interested to learn of the recent appointment of Halifax based Design Group Displays as the sales and service agent for Starlab in the Maritimes and Western Provinces. John Hault, President of the company has extensive experience in the planetarium field, and is ably assisted by Mary Lou Whitehouse. Recent certification allows the company to service Starlab equipment in Canada. Among future activities planned are Starlab user workshops in the west and the Maritimes.

The Planetarium of Montreal has recently opened its new show Climate Changes. The objectives of the show are to review the sources of recent climate changes, and to raise public awareness of the need to reduce greenhouse gas emissions. The show, funded in part by a grant from Environment Canada is available to other planetariums in Canada at no cost. Contact Pierre Chastenay at the Planetarium of Montreal for further details. Other recent openings include Frogs in Space: Kamillias Quest at the H R MacMillan Space Center.

A recent Federal Government announcement of capital funding for the National Museum of Science and Technology corporation will allow expansion of both the Canada Aviation Museum and the Canada Museum of Science and Technology. Some interested Canadians would like to see consideration being given to the development of a "National Planetarium" in Ottawa. Given the tremendous public responses to the new Hayden planetarium in New York, and the extensively refurbished Adler planetarium in Chicago, such an idea might make good sense from both programming and revenue perspectives. It would also help to reposition Canada’s planetariums as vital and significant parts of the science awareness and education resources of the country. A positioning which has suffered something of a decline since the closure of Toronto’s McLaughlin Planetarium several years ago.

Others caution that Ottawa is not on the scale of New York or Chicago, that any new planetarium should be designed as a multi-use theater facility, and that too many federal dollars are already being spent in the capital region on national museums compared to regional museums and science centers. It should be an interesting debate!
Great Lakes Planetarium Association

**Illinois:** At Lakeview Museum, the Artrain featured the *Artistry of Space* exhibition, arts from NASA and the National Air and Space Museum art collections. Artrain USA is the nation’s only traveling art museum on a train, with five rail cars housing a fine arts exhibition, interactive area, artist studio, gift shop and staff space. The 7th annual Interplanetary Bicycle Ride was held 11-12 August. In May, the German Earth and Space Center at Triton College completed its second round of JPL Solar System Educator’s Workshops, which were very successful.

“3-2-1… Blast Off!” is an interactive “video game” planetarium program that was offered this summer at the ISU Planetarium. It took people on a cyberspace solar system adventure to learn about the planets, sun, comets and asteroids. The new Planetarium Coordinator, Tom Willmitch, has begun presenting monthly Skywatch programs on the first Saturday of the month. The programs are followed by outside observing when weather permits. The William M. Staerkel Planetarium at Parkland College in Champaign recently received the upgrade of its R. A. Gray MC-10 automation system.

**Indiana:** The Muncie Community Schools’ Planetarium participated in the second year of *Window on the Universe* Week in February. A team of four space scientists and researchers made presentations to approximately 6,000 students from all grades at every school in the Muncie Community Schools, some surrounding communities, and at Ball State University. Three workshops were conducted for nearly 100 educators, and two of the scientists were the feature presenters at the *Family Science Night* events. The planetarium has also been showing Egyptian astronomy in Spanish for local 3rd year Spanish students. They study ancient civilizations in their 3rd year of Spanish. The program was also a feature for Cinco de Mayo, and now has become a regular part of Hispanic Heritage Month activities.

The E. C. Schouweiler Planetarium at the University of St. Francis in Fort Wayne has added an in-house engineered and constructed six-projector pan system, designed and built by volunteer and Fort Wayne Astronomical Society member Chris Highlen.

**Michigan:** The Delta College Planetarium in Bay City hosted their annual 4th of July fundraiser during which they provide a catered dinner, a show, and the best seats in town (on their observation deck) for one of Michigan’s largest fireworks displays. Roger B. Chaffee Planetarium in Grand Rapids is hoping for record-breaking attendance for their museum’s OMSI Star Trek exhibit *Star Trek: Federation Science* that opened in May. The museum also hosted another Star Trek related exhibit called *Trekable Collectible*. There were special Star Trek related programs every Saturday during the summer.

This summer, Kalamazoo Valley Planetarium offered *Terri & Her Telescope*, the story of a young girl who receives a new telescope for her birthday, but finds little information on how to use it until she visits an astronomer at a nearby observatory. In June, Eric Schreur traveled to Zambia to view the total solar eclipse. The Peter F. Hurst Planetarium in Jackson was closed this summer to implement a grant from the MEEKM Foundation for Digit Dome Software and a High Resolution Slide Scanner.

Longway Planetarium in Flint will be closed this summer for their Digistar II installation. The planned reopening date is 29 September. This summer they hosted an exhibit of space art by Joe Tucciarone called *Visions of the Universe*. They also hosted their ever-popular Summer Science Camps, as well as introducing *Family Science* activities designed to help families have some fun with science. The Vollbrecht Planetarium in Southfield was closed this summer and will reopen in the beginning of September. Cranbrook Institute of Science Planetarium in Bloomfield Hills has offered the in-house produced astronomy program *Visions of an Infinite Universe* during the summer.

**Ohio:** The Caryl D. Philips Space Theater has successfully upgraded its Digistar system to a Digistar II. In June, the planetarium and education facility was the location for their 31st amateur astronomers conference, the Apollo Rendezvous, jointly hosted by the Boonshoft Museum of Discovery and the Miami Valley Astronomical Society (MVAS). The museum also featured the traveling exhibit *Electric Space Bolts, Jets & Volts from the Sun through August*.

Chuck Bueter has received two grants for his paper plate work. First, the Space Telescope Science Institute, which administers the IDEAS grant, recently awarded nearly $10,000 for a project entitled *Astronomy Foundations through Art & Paper Plates*. Dr. Willie Mackey, an astrophysicist from NASA Glenn Research Center, and Bueter are collaborating with the Cleveland African American Museum to offer astronomy education workshops for selected Cleveland Public Schools teachers and for SEMAA instructors (a NASA initiative). Second, the NASA Space Science Center for Education & Outreach at DePaul University, which administers the PLATO grants, recently awarded $1000 for the editing and duplication of the *Paper Plate Astronomy* video. The video, which demonstrates the construction and use of nine technical paper plate instruments, premiered at the June SEPA-GLPA Conference. In addition, Paper Plate Education has a website under construction at <http://analyzer.depaul.edu/paperplate>. The website, hosted by DePaul University, offers references and instructions for making dozens of hands-on activities ranging from simple crafts to technical paper instruments.

Do you enjoy Jay Ryan’s Skywise column each month in *Sky & Telescope*? If it’s high on your monthly must-read list, be sure to treasure this year’s series and drop Ryan a line at <moonfinder@multiverse.com> to tell him you value his contributions. Ryan expects to bring the column to a close at the end of 2001.

Gene Zajac reports remodeling the Shaker Heights Planetarium. They recently received an AstroFX system video suite from Bowen Productions, a new console, safe slide projector racks, new Spitz controls, new lighting, and a student work area. Gene also became a Solar System Ambassador this year and notes that information and support he has received from the program has enhanced nearly every elementary lesson he does. The material also helps with the high school classes as well as public presentations. Moreover, Gene and Kelly Jons received Plato grants to create a 2/3 working scale models of the Herschel 7-foot telescope. The two scopes will be fully functional and used at star parties.

**Wisconsin/Minnesota:** The Minneapolis Planetarium has opened a new original show for younger kids and families called *Wish Upon A Star*. It follows family and friends on a trip to the country to go stargazing. They are working on an astronomical past, present, and future show called *Space Dreams*.

In Hibbing, Minnesota, the Paulucci runs 870 films and planetarium shows, including GLPA’s own *Solar System Adventure Tour*. In Waukesha, Dave DeRemer led his *Friends of the Planetarium* group on a “Sea and Sky” Chicago adventure to the Adler Planetarium and Shedd Aquarium. He also led them to a Nature Center for some serene summer stargazing. At the 2002 GLPA Conference site, the Barlow Planetarium in Menasha, conference host Karen Klaczmczyk will lead another *Space Academy*; which is in its 10th year and expects record enrollments.

**Italian Planetaria’s Friends Association**

The XVI Annual Conference of Italian Planetaria’s Friends Association will be held on 14 October in Rovigo, in the northeastern part of Italy, not so far from Venice. In the city, a public Observatory and a six-meter diameter planetarium, with an Italian projec-
tor model, are open to the public, and the school visits are managed by the local group of amateur astronomers. The previous day, the annual Day against light pollution will be celebrated in Italy.

Among the participants of the Conference will be Susan Reynolds Button, IPS Mobile Planetarium Committee, who will also be the speaker of the Week in Italy for an American planetarium operator at the end of October. This initiative is organized in the city of Brescia each year since 1995 by Serafino Zani Astronomical Observatory in collaboration with Learning Technologies, Inc. During the week, secondary students will attend Button’s lessons in the American language, under a Starlab dome. For more information, see <http://www.cityline.it/CULT/photog.htm>. Also in October, the Council Meeting of IPS will be held in Castel Gandolfo.

One of the latest planetariums of the country has been built by the Italian planetarium maker Gambato. The new planetarium operates in the Experimental Science Laboratory of Foligno (center of Italy), directed by professor Mingarelli, under a six-meter diameter dome. Other new Italian planetariums will be presented during the Meeting in Rovigo.

More than 50 planetarians from France, Switzerland, Belgium, and Germany participated last May in the first Meeting in Italy organized for the Association of French-Speaking Planetariums (APLF) directed by Agnes Acker. The first day of the meeting was held in Milan, site of the main Italian planetarium, and the following two days in Brescia and Lumezzane, visiting historical monuments and art museums of astronomical interest, the Serafino Zani Observatory, where Seppe Canonaco from Genk conducted a rocket experience. Participants were hosted for three nights in an old convent with an amazing view of Lago de Garda, the biggest Italian lake. The list of participants and some photos are available on <www.cityline.it>.

### Japan Planetarium Society

The annual conference of Japan Planetarium Society will be held on 16-18 October at Hoshi-no-Kuni Planetarium, Daitoh Cosmic Park in Nara prefecture. A new planetarium, Koriyama Fureai Science Center, nicknamed Big Eye, located at just in the next building of railway station of Kooriyama in Fukushima prefecture will open 1 October. The planetarium is equipped with Goto’s new super-bright Super Helios projector, 70mm Astrovision movie, and a video projection system controlled by Goto’s new Diccampus PC system for videos such as DVD, VHS, and Laser Disk, in their 23-m tilted dome. Diccampus is designed to be particularly convenient for live performances.

The Goto Planetarium at Shibuya in Tokyo, one of the biggest historical planetariums in Japan, closed its doors 11 March. The planetarium has suffered from decreasing attendance. The last show was broadcasted via Internet live. Lots of planetarians crowded its farewell ceremony.

### Nordic Planetarium Association

Two years have elapsed since the last Nordic Planetarium Association Conference in Tampere, Finland. This year Framtidsmuseet, The Futures Museum, in Borlange, Sweden, will host the conference. The conference will be held on 21-23 September in an autumnal beautifully colored Dalarna. Conference language is English and the registration fee is low, about 100 Euro ($80 US). The conference welcomes interested students to participate at a very low cost, 35 Euro.

The program includes paper sessions and an NPA membership meeting. Per Bromman will conduct a workshop titled Computerized small planetarium program production. Participants who remember the Black hole generator lecture during IPS’90 will expect the guest lecture by Prof. J. E. Mountain on An epoch-making invention in the field of portable mini domes to be equally enjoying. Late registrants should contact Conference Chair Hans Lundström at <hans@framtidsmuseet.se>.

A 7.5 ECTS credit part time course in planetarium program production is given at Dalarna University, Falun, Sweden, during the second part of the fall semester. The lecturer is Per Bromman and course dates are Wednesdays and Fridays every second week beginning 24 October and ending 21 December, making it possible for students to attend without having to live in Falun for the whole duration of the course. Contact Bromman at <pbr@duse> or study <www.duse/ lab/science.html> for more information.

### Rocky Mountain Planetarium Association

Fiske Planetarium, Boulder, Colorado, has a new Programs Supervisor. Fransisco “Tito” Salas has taken over for Geoff Skelton. Salas will be managing the theater, producing new shows, and working with University professors to further develop classroom support. His contact address is <Salas@ucsu.colorado.edu>. Skelton will be leaving Colorado 1 August, bound for Chicago, where he hopes to stay at least peripherally involved with the planetarium field, and can be reached at <skelton@colorado.edu>.

Earl Faulkner, for whom the Faulkner Planetarium, Twin Falls, is named, passed away on 17 June of natural causes. Mr. Faulk-
ner was 89 years old. A business fixture in Twin Falls since the 1950s, Mr. Faulkner was instrumental in raising funds for the construction of the planetarium. Mr. Faulkner was also awarded RMPA's Founders Award in 1999. His spirit will be sorely missed, but not forgotten.

Faulkner Planetarium has recently purchased a Coronado H-alpha filter for its 10-inch Meade telescope. Upon the very first use of the filter a plague erupted. Over the next 25 minutes the eruption rose to great height and subsided. Semi-regular solar observing sessions will now be offered in addition to the monthly star parties. The first major public use was at the 23 June Craters of the Moon Star Party hosted by the Magic Valley Astronomical Society and the Idaho Falls Astronomical Society, and held at the Craters of the Moon National Monument.

On 1 February of this year, management of Hansen Planetarium transferred back from the University of Utah to Salt Lake County. While this change was happening, plans were being developed to open a new planetarium and large format theater (IMAX or 15/70 Iweks) combined facility in the new Gateway area of downtown Salt Lake City (next door to the Delta Center, home of the Utah Jazz.) The Gateway district is a 2-block by 3-block area of the town that has been rebuilt from ground up. It will soon be home to movie theaters, upscale retail stores, restaurants, condos and apartments, business offices, and a new planetarium with decent exhibit space, and a large format theater. The planetarium will even be next to a stop on the new light-rail mass transit line.

The Salt Lake County Council recently approved a bond for US $15 million to build the facility (see illustration on previous page). As this is written (late June), the planetarium management is working out the cost and construction details of the facility. There is a hole in the ground, concrete is poured, and steel is going up. The goal is to open the facility by October 2002. Plans are to install a full-dome video projection system as the backbone of the theater. The Digistar II planetarium projector will be kept.

Salt Lake County seems to be really excited about this project, and the planetarium is enjoying “front-burner” status as the project moves through the various agencies of local government. The new facility will be about 4000 m² (40,000 square feet). This is the size of the shell building being constructed at Gateway for the planetarium. This means that the planetarians have to get creative about combining lobby space with exhibit space, and designing the open spaces for good crowd flow and access to the exhibits area, gift shop, restrooms, elevators, etc. The entire staff will work in office space being constructed in 900 m² below the main entrance and lobby. Hansen Planetarium has been in its current location for 37 years. Now a facility is designed that will keep it going for at least as long into the future.

Russian Planetarium Association

On 6-13 April, all planetariums of Russia arranged meetings devoted to the 40-year jubilee of the first man’s flight to cosmos. George Grechko made a speech on the Conference "Nizhny Novgorod citizens and cosmonauts" and presented to the Nizhny Novgorod planetarium the medal of Gagarin and the diploma of the Federation of the Cosmonauts of Russia.

On 26-27 May, the VIII Conference of RPA took place in Moscow. There the results of the All-Russian competition of planetarium shows were presented. This competition was conducted with the support of the Astronomical Society. The winners were Galina Zheleznnyak, Harkov Planetarium, for Amazing Universe, Irina Bakumina, Nizhny Novgorod Planetarium, for New Year Cosmic Trip of the Kolobok, and Tamara Petrakova, The Planetarium of the State Museum of the Cosmonauts in Kaluga, for Where does the Sun Hide? (show for the children of 5-7 years).

The conference participants visited the Center of the Cosmic flights management in the town Korolev in the Moscow region and the Optical Theater in Moscow.

On 28 May the participants came to Kostroma, where on 29-30 May, an interregional conference devoted to the 50-year jubilee of Kostroma Planetarium took place. The participants of this conference greeted past-president of IPS Dale Smith who came to Russia. Also in May, the buildings of Harkov and Barnaul planetariums were threatened to be transferred to religious societies.

Vladimir V. Radzhevskij - the first director of Yaroslavl Planetarium (1948-49) and Honored Science Worker of Russia (1971) - celebrated his 90-year jubilee on 30 June. The asteroid N3923 (1976 SN3) is named in honor of Radzhevskij, who was professor at the Nizhegorodskii Pedagogical Institute and known for his work in celestial mechanics, the cosmogony of the solar system, and the origin of comets.

Southeastern Planetarium Association

SEPA recently concluded its annual conference, which ran 26-30 June. The conference was a combined meeting with GLPA and, due to the relatively large membership of each organization, attracted a large number of participants. Invited talks included John Stoke, who gave an impassioned Spitz Lecture, and Dr. James B. Kalser who gave his annual astronomy update. The 20-m (68-foot) dome of Eastern Kentucky University’s Hummel Planetarium was the backdrop for a variety of planetarium shows and vendor demonstrations. Conference host and planetarium director Jack Fletcher was accorded several enthusiastic gestures of appreciation from the assembled delegates. Fletcher was gracious in recognizing the tremendous assistance from his assistant Cory Anderson and other staff and volunteers.

Two long-time SEPA members were given the organization’s highest award, the Paul Campbell Fellowship Award. This honor was accorded to Duncan Teague of the Craig­mont Planetarium in Memphis, and to John Hare of Ash Enterprises and formerly of the Bishop Planetarium in Bradenton, Florida. Phillip Groce, representing Baton Rouge, Louisiana gave details of next year’s SEPA conference which will be hosted under their new 18-m (60-foot), tilted-dome at the Pen­nington Planetarium and ExxonMobil Space Theater. The conference is planned for late June 2002. Details will be published in the next issue of the Planetarium. Finally, the site for the 2003 conference will be decided from invitations from Cocoa, Florida; Richmond, Virginia; and West Palm Beach, Florida. Announcements will be posted to various media including SEPA’s web site <www.sepdomes.org>.

Southwestern Association of Planetariums

Barbara Baber of Abilene, Donna Favour from Richardson, and Donna Pierce from Highland Park have all retired as of this writing. Donna Pierce is actually semi-retired. She is working 40% time, just running the planetarium. The trio is currently planning a trip to Italy in October, so our IPS friends there may want to watch out for this wild Texas group. Craig Carroll has been assigned to replace Baber in the Abilene Planetarium. Unfortunately, Carroll has only been in the planetarium twice. So, all the SWAP members have offered to help him learn the ropes and hope to meet him in August for the annual pot-luck dinner meeting.

John Cotten of the Science Place has been awarded a patent for his invention, a lap lighting system to be used in planetariums. If you’ve had the opportunity to visit the Science Place Planetarium, you have experienced something that many planetariums would dearly love, a system to light up star charts and such without destroying the dark adaptation of the audience.

The worst SWAP news is the closing of the Richardson Independent School District's
Planetarium. The school board decided to close the planetarium in order to save money. This is a tremendous loss to the Richardson area. The RISD Planetarium had the only heliostat in the metroplex. Also, the RISD Planetarium is located in a city well known for its technology businesses. When the news broke about the closing, a number of parents, planetarians, teachers, and businesses came forward to support the planetarium. The board promised to review the decision for the 2002-2003 school year. Jim McConnell and Ann Seeley have been reassigned to other positions in the district.

Bess Amaral (formerly of Roswell) is now working at the St. Mark’s School, Dallas, Texas as an Earth Science teacher and as Stephen Balog’s assistant in the planetarium there. She has gotten her feet wet at St. Marks by doing summer planetarium shows for the school’s Day Camp and Science Camp in June and July. Steve Balog of St. Mark’s School has been awarded the Cecil & Ida Green Master Teaching Chair in Physical Science. The position is similar to tenure in a college or university setting.

The Space Center in Alamogordo, New Mexico has a new name: it is now the New Mexico Museum of Space History, a name that more correctly identifies it to the public. To celebrate this event, the museum held a grand re-opening on 2 June with new permanent exhibits in the museum, NASA vans with a mock-up of the International Space Station displayed in the parking lot, and the beginning of the summer laser show season.
Autumnal/spring greetings.

My boss, Patrick McQuillan, suggested the topic which is covered in this issue's column. Here it is

What is the weirdest/funniest situation you've been in during your planetarium career, or what is the strangest/funniest question you've been asked by a visitor?

I can tell from the smile on George Reed's face that he has just remembered something funny, so let's hear his story.

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The most interesting planetarium visit I had occurred when a group of around 15 detention center females came to the planetarium. They were all young prostitutes. It seems as if everyone who knew about the group just happened to be nearby when they arrived. Hey, I agreed to the visit because I was curious, too. Everything proceeded as normal in the dark. (Of course I'm referring to the presentation). One of the girls did want to see "her constellation." It was Virgo, as you can guess. Out of the dark came the girl bashfully pointing down with her two clasped arms "A minute or two after the lights went out, this speaker fell on my arm." "That's awful," I countered. "Why didn't you say something earlier?" "Because I didn't want to miss any of the show," she mused.

The women really did break her arm. After an all-expense-paid trip to the emergency room, and a couple of hundred apologies, I learned two things about conducting light shows under a dome: always securely fasten your speakers, and never underestimate the true fortitude of fans!

Mitch Luman, Director
Koch Science Center and Planetarium
411 SE Riverside Drive
Evansville, Indiana, 47713

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We've actually gotten phone calls from people asking for advice about plants, since we're a PLANTarium. (Calls like this inspired the title of a show we did several years ago, called "No, We Don't Sell Plants at the Planetarium"). One caller, confusing us with our neighboring aquarium, said he wanted to donate a catfish. We're still wondering about that one.

I was once asked by a young woman after an evening show how we managed to open the dome so quietly.

During a show that ended with a thunderstorm sequence, a visitor opened an umbrella in the theater.

We once did a special show for a very New Age group, who wanted to "prepare" the theater beforehand by burning incense and hanging crystals in the corners of the room. We explained to them why neither was possible, due to fire-code regulations and the fact that a round room has no corners.

One of our technicians is a short, always-cheerful Englishman with a very noticeable accent, and when he was helping seat a group to a show, a wide-eyed, awestruck little girl bashfully approached him and very sheepishly asked "Are you a leprechaun?"

A kid asked if there's really a constellation called, "Poop". I clarified that he was most likely thinking of Puppis the Poop Deck, or more politely - the Ship's Stern.

One presenter usually included a little information about our star projector in his introductions, leading into it by posing the question asked by many visitors: "What's that thing in the middle of the room?" On one occasion, just as he asked the question, drawing everyone's attention to the machine, as if on cue, a loose constellation attachment fell off the star projector, hitting the platform with a clunk. He recovered nicely: "That's the planetarium star projector - when it works."

Students from the astronomy class at a local community college are given extra credit if they have our lecturer sign a card as proof that they attended a show, and as one class was getting a lecturer's signature, some tourists thought the students were lining up for a celebrity autograph and got in line behind them.

Years ago, we had a show that started with an old-style rocket launch effect done with a rising projector that had to be cued manually. On one occasion, the operator forgot to cycle the projector properly, and when the time came to bring up the effect, our Saturn V rocket came down for a perfect landing on the pad.

Another effect in the old days involved projecting a slide through a shallow, transparent dish containing water, which was agitated so that we could make the image ripple. Then, we turned off the agitator so the rippling stopped and the image cleared dramatically - in theory, anyway. During one show, just as the lecturer turned the effect on, a drowsy cockroach floated by.

Then, of course, there are occasional activities that take place during certain shows (often laser shows) that people should be reserving for the privacy of their homes, and the interesting items that ushers would occasionally find on the floor after shows, ranging from bong pipes to used condoms.

We got an odd call once from someone who wanted to find out how to get to the Griffith Observatory in Los Angeles. She said she called us because she remembered visiting San Francisco once and recalled a big planetarium, and assumed that we knew the way. When we asked where she was calling from, it turned out that she was actually calling from Los Angeles.

A former member of our museum's exhib-
it department once asked what shade of black we used to paint the dome to simulate the night sky.

Bing Quock
Morrison Planetarium
California Academy of Sciences
Golden Gate Park
San Francisco, California 94118

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As a preshow introduction to the constellations with elementary school students, we often use a collection of stuffed animals and dolls to review the constellation names. We have quite a collection, including two stuffed bears for Ursa Major and Ursa Minor, a winged horse for Pegasus, and two stuffed dogs for Canis Major and Canis Minor. For the Gemini Twins, we have two identical "Kens" dolls, dressed in Roman garb, and for Cassiopeia and Andromeda we have two "Barbies" dolls. Cassiopeia has a crown and is dressed in long regal robes, and Andromeda was dressed in a flashy metallic silver outfit.

Since our Project Starwalk students have studied the star map and constellation names before coming to the planetarium, I'll often point out the constellation at the overhead, hold up the doll, and ask "What's the name of this constellation". The most memorable response came from a local third grade class. I held up the Andromeda doll, pointed to the stars on the map, and asked the question. I called on a student in the front row. He responded, "It's a whore".

I quickly called on another student, and we later changed Andromeda's outfit.

Sheldon Schafer, V.P. of Education
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The strangest situation or funniest question? There are so many. I don't know that I could choose just one. After a live school program I walked around the theater to check for debris. Upon reaching the back row, I noticed a pile of torn paper. I thought I must have given a particularly boring program, that one child spent the time tearing up paper into tiny bits. On closer inspection I recognized a certain forest green shade of color to some of the bits. Then the number 20 on what looked like a corner piece. Yes, the kid had given me a very big tip, but I had to work for it. We found all the pieces and taped the $20 bill back together. We contacted the school and returned the bill (or an untorn one exchanged at the bank for the torn one) to the unfortunate child who had unknowingly torn up his lunch money for the week.

There was another time that I was doing some maintenance in the theater. Our sound system was located up behind the dome. To get there one needed to climb a ladder and step onto a series of 2" by 12" boards that formed a narrow walk way above the suspended ceiling. It was a bit wider than an Olympic style beam in gymnastics. The speakers were located on a board that crossed the corner. Yes, our theater is a square room with a dome in the middle. After I finished my work, I stood up and turned around in the under-lighted space behind the dome and took a step ... into space. Amazingly, I crashed cleanly through the suspended ceiling and landed on my feet one floor below. I had "stuck" the dismount! Unfortunately the factor of difficulty was very small. Except for being shaken (I also had a small but nasty cut on my neck from one of the ceiling supports) I was fine. When we renovated the theater a few years later, the ceiling was completely floored in.

Or I could talk about the time I was doing a program on day and night for a group of first graders. I have one child sit in a swivel chair representing the Earth while another child using a flashlight represents the Sun. After a discussion explaining the need to find a particular place to represent where we are located on the earth (the head of the child in the chair) I lead them by means of a pointing finger and a quite innocent suggestion, "Why don't we pick his nose?"

Dave Maness
Peninsula Planetarium
Virginia Living Museum
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Newport News, Virginia 23601

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Weirdest experience in a dome? Most of those I'd rather not remember ... But I do recall one instance born of desperation.

I'd taken the StarLab out to a nature center for the post-Christmas camp. (How many out there have done programming while on your vacation? Hands? Thought so.) The theme was Moon and stars, and the camp directors wanted a short sky mythology tour for several dozen young children.

Starlab barely squeezes into the single large room at the nature center, and all the noisy campers were swarming in the narrow hall just outside that space, shedding muddy boots and losing mittens. Getting them into some semblance of order and into StarLab looked to be a losing proposition.

Rabbits. Recalling a brilliant suggestion from former intern Susanna Olsen, I told the seething mass that we were all going to be rabbits. Very small, very quiet rabbits, crawling carefully into our underground burrow, listening and watching for hawks. If we were very quiet and clever, we'd make it underground safely.

Those kids became rabbits. You could almost see their ears elongating, their eyes widening, and their little brains gearing up. We practiced freezing in place when the hawk-shadow came over, scuttled quietly through the tunnel, and raised paws to ask questions. They were terrific.

I had a note from the new director afterwards, who said, "The campers stayed focused on you, the stars and the spacelab. They did not take the opportunity to harass each other in the dark. That tells me they were busy learning and having fun."

April Whitt, Astronomer
Fernbank Science Center
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Atlanta, Georgia 30307

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Back in my salad days when I was a green intern at Morehead Planetarium in Chapel Hill, North Carolina (about two hundred years ago), we had a special short show on dental hygiene that preceded our pre-school program. (Don't ask me why; I think it was by special arrangement with a state or local agency.) The pre-show featured Tuffy the Tooth, a giant, seven-foot high molar, worn by a black leotard-clad co-ed brandishing a giant toothbrush. Tuffy would enter the theater and prance about, gesticulating with her toothbrush while slides and narration explained the finer points of good dental habits to our youngest show-goers.

During one particularly memorable show, Tuffy's introduction went as planned, but the audience was not prepared to behold the sudden appearance of a giant, white, smiling tooth towering above it in the semi-darkness, waving a giant brush. One of the little tykes shrieked, the rest followed, and pandemonium ensued - kids running about the theater, others trying to hide under the seats, all squealing in terror as they tried to escape the bobbing, enameled horror with the permanent smile frozen upon its face. Several staff and teachers tried to collect and calm the kids, while another staffer grabbed Tuffy by the arm and unceremoniously dragged her from the theater, still waving her brush. Once the tooth had been "extracted" and the lights brought to full, the children were calmed and the regular show proceeded, more or less, minus the tips on tooth-brushing.

The children all survived their "brush" with terror in the planetarium, but I wondered, occasionally, if any of them needed counseling in later years to deal with linger-
ing dental phobias. In any case, Tuffy returned to fight tooth decay another day, although the pre-show ended its run not long after.

All to suggest that if you’re looking for something a little-kid-scary for your next Halloween show, you could do worse than to consider a giant smiling tooth ....

Jim Manning
Taylor Planetarium
Museum of the Rockies
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Here’s one of the stranger planetarium situations I’ve been involved with. Every year, on the third Wednesday in February, our museum hosts Engineering Fair. This program, held in cooperation with the Oklahoma Society of Professional Engineers, allows all interested junior and senior high school students attend the museum for free. Students participate in typical engineering fair activities such as bridge building, Rube Goldberg-type machines and ping-pong ball launchers. As many as 5,000 students have visited our museum on these days. This day represents the lowest sponsor/student ratio in the museum each year. We pick up toothpicks and straws for days afterwards.

The planetarium’s part of the day’s activities involves presenting eight, 15-minute live sky shows on the half hour from 10:00 a.m. through 3:30 p.m. A few years ago, we had a situation in the planetarium that threatened to create more than the usual chaos for the day. The museum is located adjacent to the Oklahoma City Zoo, one of the largest zoos in the country. As you might expect, the zoo’s proximity draws numerous unwanted guests such as field mice attracted to the large supply of food and rat snakes attracted to the large supply of field mice. Some of the most unwanted guests are water roaches. These make the typical German roach of college dorm room fame look like ants. They can grow to four inches or more in length, and have been known to carry off small infants.

On the day in question, we had just completed the first of our eight shows. As we were setting up for the second, we noticed one of these giant roaches on the dome almost due south and nearly 60 degrees altitude. We had no way of getting it down, so we just prayed none of the students would notice it. It stayed through the next two shows but had disappeared by the end of the fourth show. We never heard any screaming, so it apparently didn’t drop onto anyone.

We had noticed that the roach was sitting very near Alpha Orionis. Sorta gives a whole new meaning to Betelgeuse!

Wayne Wyrick
Kirkpatrick Planetarium
Science and Air Space Museum
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Arriving at the planetarium at 6:30 p.m. on December 9, 2000, I looked up as I got out of the car, as is my habit, to check out the sky conditions. And there, high in the sky, moving from SW to NE, were two bright “stars,” one following the other a few degrees behind. Of course I instantly recognized that these must be the ISS and the Endeavor, which had separated from the ISS earlier that afternoon. The ISS was nearly as bright as Jupiter, about -2.5 mag, and the Shuttle was about -1.5. It was an amazing sight to see them so close together, one following the other. (I verified that they were crossing my sky at 6:30 that night when I went inside.)

But the story doesn’t end there. Just as I was opening my doors for the public show, a woman came up. I thought she was a guest there to see the show, but no, she was there to talk to the Planetarium “Astrologer.” It seems that a few days earlier, she couldn’t remember which, she got up before dawn to do her meditation (start cringing.) While looking out her sliding glass doors she saw what she thought was a plane at first, but then realized that it was a “star.” It was very bright, about as bright as Jupiter she admitted when I pointed it out to her, but it was moving to the east. She said that when she watched it go “over the eastern horizon, getting dimmer as it went around the curve of the Earth until it winked out.” Obviously a satellite, most likely the Shuttle docked with the ISS. Her description matched perfectly what I had just witnessed myself not more than an hour earlier.

“No”, she said, “It was a star!” I tried to gently explain that stars rise in the east and move west, not the other way around, but that the ISS/Shuttle would look like a moving star going E-NE. “No”, she said, “It was a star!” What’s more, it threw off a “blue electrical discharge” as it went behind the trees. I tried to explain that a bright star-like object that was sinking lower in the sky would be viewed through more and more atmosphere, resulting in greater... “No”, she said, “It was a star!” She then demanded to see the planetarium “Astrologer” who could tell her what this meant. When I told her that I run the planetarium, and that we are astronomers not astrologers, she left saying that she would come back another time, when the “Astrologer” was in. (Why me?)

As I started to sell tickets to normal, everyday people looking to learn about astronomy, I couldn’t help thinking about her and how bright the ISS was with its first set of solar panels. I’d known that NASA had been saying that it will surpass Venus in brightness by the end of this year, but I hadn’t really thought about the consequences. Most people don’t realize that you can see many satellites and space debris with the naked eye. So it looks like the ISS will bring out all kinds of astrology fanatics like this woman, and the UFO nuts as well. Get ready for them. It has started already.

Laurent A. Pellerin, Jr.
Operations & Production
Seminole Community College Planetarium
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So, lots of good stories from dome land which rank high on the mirth meter. They confirm what people in the north of England say, that, “There’s nowt as queer as folk.”

One of my own weird experiences occurred a few months ago, when a visitor put his nose about one inch from mine and began snorting like a bull and flexing his muscles, because I was reluctant to let him in without a ticket. To cut a long story short, he eventually realized he did, after all, have a ticket, but had forgotten it was in his pocket.

Before I joined the staff here in Jack­sonville, a husband and wife left their baby in the dome after a show. The father thought the mother had it, and vice versa.

The topic for the next column is a quote from George Reed’s article, “Who In The Hell Needs A Planetarium,” which appeared in the March 1994 Planetarian.

“If the planetarium is used simply and only to disseminate information, then it will ultimately fail.”

Do you agree or disagree with George’s comment?

I’ll be delighted to receive your considered responses by the deadline of October 18.
I prepared lessons through the years with the assistance of many people: other planetarians, science supervisors, principals, and, of course, the teachers who came with their classes. But the most critical member of the "team" which made my planetarium program successful was not any of these.

It did not take me long to realize who the most crucial member of the team was for making the planetarium viable. That person was the bus driver who brought the students to the planetarium!

Now, this may not be true in a museum-based planetarium where students have something else to do besides visit your planetarium. In my case, they came to the planetarium only and there is no "waiting area" with posters, exhibits, etc. to amuse them.

When the bus pulls up to the planetarium, and discharges the children, I want to know that the bus is not going to pull off and never come back. I need it to stay there in case this class needs to go back to school before the lesson is over because of behavior problems.

I met each bus, got on the bus, and assessed each class's good behavior level. Several times in my tenure, I turned to the bus driver, and said "Take these children back to their school". Notice that I hadn't even spoken to the teacher yet!

Yep, the bus driver is the most important member of the team. I would always get on their good side. By actual count, the bus drivers delivered and I taught 328,620 students, one class at a time. Whew! Time for a rest!

That's my story. I've been privileged to comment in this column about other planetarium's stories. Here are some favorites of mine from past columns. For brevity's sake, I will paraphrase some items, and I will identify the source only by the name of the individual. Enjoy your tour through planetarianism!

From first issue, June 1972:

Hide in the bushes outside a building and watch people as they go to their cars; you may spot a "planetarian." As he exits the building, he will seem momentarily paralyzed when confronted by sunlight.

He blinks a lot and throws his arms in front of his face as he shrinks back. If you are watching at night, he may seem to stumble as he leaves the building. He will be looking up, checking whether the real sky is set correctly. He may pause, take a pointer from his pocket, and seem to trace lines in the sky.

The observer in the bushes might also glance around at the empty cars, for 9 times out of 10, the one with the most dented fenders will belong to the planetarian. You see, he has frequent minor wrecks, caused by inattention, particularly at night. He prefers to look at the sky to ascertain directions instead of using well-marked road maps or the floating compass attached to his windshield. It's an ego thing, difficult to overcome ...

1984: from Famous Planetarians Talent Test [modeled after the matchbook invitation "Learn to Draw"]; Source unknown.

1) The sun is rising in the planetarium. Suitable narration would be:
   a) Now we see the sun
   b) Now we see the sun rising in the east
   c) As the faint glow of dawn ascends stealthily in the east, the dark sky with its star-spangled celebrations must yield to the sun; and the sun in turn, unselfishly surrenders its life-giving warmth so that the earth may bloom and prosper
   d) Look at the sun

1984: Appropriately Named Space Theaters

Jon Bell, Francine Jackson and Jane Geoghegan (Hastings) suggested these:

Astronauseum: A which

Flatuartium: A facility which simulates the methane gas and other gases in the atmospheres of the gas giant planets.

Armageddome: Planetarium whose program specialty is the ultimate end of the universe.

Pulsarium: Facility which utilizes energy from nearby neutron stars to activate stunning visual special effects.

Solorium: Think of it! Be the first in your district to have a greenhouse by day and a star theatre by night! The star projector projects only one star, but with an apparent magnitude of -26!

Ennusphere: A place where only dull planetarium shows are presented. *See also: Boritorium, Tedium, and Dulldome

Pubesarium: a dark, domed environment in which 8th graders learn about stars, planets and other bodies.

Humdrome: A combination beehive, research center and planetarium. This facility studies the stellar orientation of stinging insects to the Praesepe star cluster.

Hertzsprung-Russellearium: Finally! A theatre devoted to the use of every single technical diagram ever used in an astronomy textbook.

Recyclotron: Not a planetarium, but a facility that exists to enable planetarians to exchange one unwanted special effect projector for another.

Diarrhearama: A planetarium for long-running sky shows.

Spitzarium: Any facility whose star projector says its name when you turn it on.
Anachrodome: Any currently existing planetarium which started out as something else; e.g., hockey arena, stairwell, library.

Planhairium: Every seat has a hair dryer! To work in this fabulous facility, one must have a degree in cosmetology.

Alternatarium: A planetarium which was later converted to something else more profitable; e.g., hockey arena, stairwell, library.

One-Liners

1977: Tom Hamilton, in a document satirizing planetariumism: ‘Workshop Topic: ‘Construction of Bolide Projectors with Matches and a Slingshot’. The leader of this workshop has received critical acclaim for previous projects such as converting several Kodagraphic slide projectors into cigar boxes.’

1978: Paul Campbell says there are two open-ended questions you should never ask in the planetarium: “If you were going to throw a big heavy bear into the sky, where would you grab him?” and “What do you think Orion did when he caught up to the Seven Sisters?”

1980: Jim Summers responded to a call from a distressed lady who noticed that three planets and a bright star were very close together in the night sky and felt that this grouping reinforced the impending doom of the earth. He said: “Well, ma’am, we astronomers have control of all this. For a fee, we could arrange for those ol’ planets to begin drifting apart!”

1980: Jack Dunn received a letter from an impressed visitor. It said, “You really seemed to know your stuff good. You said it just like you had said it 1000 times before, and you didn’t even stutter once.”

1981: George Reed, on writing planetarium shows, “Having good ideas is like a pregnant woman; the fun is in the conception, with the labor to follow!”

1982: John Wells was a consultant for a nearby county as they decided whether or not to get a planetarium. They wanted to put it in an existing building, used years ago as a federal hospital. The room they selected for the planetarium was the morgue.

1982: Jack Horkheimer, star of the popular PBS show: the Star Hustler (now called the more politically correct Star Gazer) was interviewed by a Miami newspaper on the subject of an epitaph he would like on his grave. Jack’s answer: “Keep Looking Up’ was my admonition; I can do nothing else in my present position.”

1983: Phyllis Pitluga, planetarium in Chicago, was describing how laser pointers were bright enough to point out constellations in the real sky. Question from audience: “Do you have to generate smoke to see the laser beam?” Phyllis’ answer: “Not in Chicago!”

1983: Robert Hitt, on collecting stuff to be made into “projectors”: “Our motto is never throw anything away—it might work in the dark and besides nobody knows what a black hole looks like anyway!”

1984: Jon Bell interviewed the author Isaac Asimov and asked him if he knew that two of his stories had been produced as planetarium shows. Asimov said, “Of course I’m aware of it; I’ve attended several productions of each. I have been enthralled by the story each time and couldn’t wait to see how it ended!”

1985: Richard Knapp, commenting on participants from the same facility who come to a planetarium conference: “The director comes fee-paid, the intern comes on a grant, and the staff pays its own way!”

1985: Donald McDonald was told by his doctor to stay away from planetarium conferences because they were ruining his health. Don: “Will I live longer if I do?” Doctor: “No, but it will seem longer.”

1985: Scott Polh: “I have an A3P projector with a 75-watt bulb. I like it. I can read by the light of Sirius.”

1986: Jon Bell charges a fee for someone to look through the telescope at Comet Halley. “If they see it for free, they feel like they’re not getting anything!”

1986: Mike Hutton, praising automated planetariums: “Well, first you rewind the tape, then you look and see if the audience is seated, push the button, and open the refrigerator in back for a cold drink.”

1987: Deborah Byrd, guest speaker at a planetarium conference: “People don’t know the difference between a galaxy and the solar system. Now... probably because of you guys... people aren’t sure about the difference between a galaxy and the solar system.”

1987: Astronaut John Young, guest speaker at a planetarium conference: “In the Apollo days, when we were learning about constellations at the Morehead Planetarium in Chapel Hill, N.C., we were deprived of an announced trip to Australia to study southern hemisphere skies because the planetarium did such a good job of showing them!”

1988: Wayne Wyrick was called at the planetarium office by officials in a small nearby town and asked what time sunset occurred on a specific date. It seems that, in Oklahoma, the distinction between the crimes of “Breaking and Entering” and “Burglary” depends on whether the crime happens before or after sunset. Such a distinction was necessary for the officials to determine the severity of impending criminal charges.

1991: Keith Johnson puzzled over a printed planetarium ad which promised a “4-foot gray whale.” They had no whale at the planetarium. The staff finally figured out that a badly garbled ad phone-in for a “5-foot gravity well” might explain it.

1991: Carole Helper has discovered that the “be available and open to opportunities” section of her printed planetarium job description really means “put in long hours.”

1992: George Fleenor: “Monday: that’s the day we fix everything in the planetarium that broke over the weekend.”

1993: Dr. Harry van der Laan on Space Theatres with Omnimax and Digistar: “Stop hopping from mountain top to crevasse, and use quiet care to show the complexity of the world.”

1994: The gremlins were at work in Joe Halley’s planetarium as the slide which dropped into the gate at the narrator’s words “And God said...” showed the words “This Way Out”.

1994: A planetarium with no money in its budget for new equipment ordered the following items: one replacement lamp, one replacement lamp housing, one replacement slide gate, etc. After filing the order, he secretly called the equipment company and said: “Now put them all together and send me a new slide projector!”

1996: Planetariums sometimes initiate surveys to determine what the public wants. Most all surveys include “constellations” as a desired topic. Planetarian Gary Tomlinson believes this response shows that “either people want constellations in every show or they don’t know anything else to put down!”

1999: Carole Helper spoke to a woman employee who was new at the planetarium. Carole said: “You don’t have any planetarium experience. How did you get the job?” Lady: “They said I was just what they were looking for!”

Things Planetarians Dread to Hear

1976: Teacher, to planetarian, as she enters chamber, “I don’t understand why they give me a bad class every year.”

1978: Phone call to Jimmy Hooks from a parent whose child had visited the planetarium that day: “What’s the idea of telling my child to go outside and look at the stars while naked?”

All years: Phone call to all planetariums: “Do you have any plants on sale this week?”

1981: Question from planetarium visitor to Betty Wasiluk, “When does the ride start?”

1982: Phone call to planetarium: “Is this where they pick up the dead dogs?”

1982: Phone call to Paul Knappenberger.
"I really want to thank you for informing us about the planet alignment on the 10th of March. I did what you said on the radio, went outside to look, and I was absolutely amazed! I did, I saw all nine planets all together in line, just like you said!"

1985: Get mentally set for a grueling day in the planetarium if "Pubites" are coming. That's what Greg Thomas calls 8th graders.

1989: John Pogue has a name for the seemingly uncontrollable urge that overcomes some youngsters to light up their LCD watch dials during planetarium shows: "Chronoluminesis."

1992: "My uncle says that astronauts are just pretend-float above a fake earth when we see them on TV."

1993: "Your planetarium has been here since 1970. What makes you think it's still a useful educational tool in 1993?"

1994: Teacher with class in planetarium, "helping" planetarium person: "The phases of the moon are called first quarter, second, third quarter and full. The phases of the moon happen because we see the moon from different sides of the earth."

1994: "Mrs. Hastings, I'm glad the eclipse is so late at night because people probably won't stay up that late and they won't hurt their eyes looking at it."

1995: Zeiss was installing a new product in the planetarium. The Zeiss representative said: "Now for the test; turn on the stars."

2001: A phone call to the Beijing Planetarium: "Do you need to wear a raincoat during the meteor shower?"

Comments in Planetarium

1979: Student: "You know, we'll never see another full moon." Planetarian: "Really! Why not?" Student: "Because the astronauts brought some it back with them!"

1979: Planetarian Phil Groce: "What do you think of UFOs?" Visitor: "They're OK, but you can still get pregnant."

1981: One visitor, after a starshow with a loud, animated ending told Henry Mitchell: "That was a very nice program. If I might show her 'Candace' in the sky. Being interested in more than just stars, I agreed and began to compare the star map they sent with a 12th magnitude database. The star they had circled was not there. "Wait a minute", I thought, 'if the star is bright enough to appear on a map of 5th magnitude stars, why isn't it in the database?' After checking several other databases with similar luck, I got suspicious. So I examined the area with a magnifier, and sure enough, the company (no names mentioned, but their initials are ISR) had added a star with a felt-tip pen!!! Well, we scoured the area anyway with a 21-inch telescope and saw a number of stars that could have been 'Candace' (if there even was such a thing). Candace was happy, since she learned a lot about the sky. I was happy because I learned a lot about Candace. She's now my fiancée.

2000: Theodor Habel reports a very creative way of involving students in a lesson at the planetarium. At the beginning of the lesson, one of the two planetarians present in the room uses a digital camera to take two images; each is one-half of the audience. He tells the students to act as weird as they want as they pose for the pictures. No explanation is given as to why the pictures are being taken.

The lesson begins. At the end of the lesson, an oral quiz is given on the ideas presented in the lesson. The presenter suggests that a competition be waged: one side of the room against the other. (During the lesson, the two digital images taken earlier have been downloaded to a computer hooked to a data projector.) When a winning side of the room for the quiz is determined, a picture of the winning team is shown on the dome!
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