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(1) 406-994-6874
(1) 406-994-2682 fax
amjmjn@gemini.oscs.montana.edu

President Elect
Thomas W. Kraupe
The Natural Sky Planetarium
Rumford, RI 02916
(401) 278-2600
(401) 278-8397 fax
tkraupe@esos.org
100626.1077@compuserve.com

Past President
William Gutshall
25 The Commons
Smoke Rise
Kinnelon, New Jersey 07405
(1) 201-492-8165
(1) 201-492-1836 fax
102417.2073@compuserve.com

Executive Secretary
Lee Ann Hennig, Planetarium
Thomas Jefferson High School
6500 Braddock Road
Alexandria, Virginia 22312 USA
(1) 703-750-8380
(1) 703-750-5010 fax
lahemmig@pen.k12.va.us

Treasurer and Membership Chairman
Keith Johnson
Fleischmann Planetarium
University of Nevada
Reno, Nevada 89557 USA
(1) 702-784-4812
(1) 702-784-4822 fax
keithj@equinox.unr.edu

1998 Conference Chair
Undine Concanon
Planetarium Administrator
London Planetarium
Marylebone Road
London NW1 5LR England
(44) 171-486-1121
(44) 171-465-0862 fax

Historian/Photo-Archivist
John Hare
Ash Enterprises
3602 23rd Avenue West
Bradenton, Florida 34205 USA
(1) 941-746-3522
(1) 804-266-7966 fax
jihare@aol.com

Publications Chair
Undine Concanon
Planetarium Administrator
London Planetarium
Marylebone Road
London NW1 5LR England
(44) 171-486-1121
(44) 171-465-0862 fax

Elections Committee Chairman
Mitch Smith
Benedum Natural Science Center
Oglebay Park
Wheeling, WV 26003
(1) 304-243-4034
(1) 304-243-4110 fax
72467.2051@compuserve.com

I. P. S. Affiliate Representatives

Association of French-Speaking Planetariums
Agnès Acker
Planetarium Strasbourg
Université Louis Pasteur
Rue de L’Observatoire
6700 Strasbourg, France
(88) 36-12-51

Assoc. of Mexican Planetariums
Ignacio Castro Pinal
Museo Tecnologico C.F.E.
Apartado Postal 18-816
C.P. 05300 Mexico City, D.F. Mexico
(52) 5 5-16-13-57
(52) 5 5-16-55-20 fax

British Assoc. of Planetariums
Undine Concanon
London Planetarium
Marylebone Road
London NW1 5LR, England
(44) 171-487-0227
(44) 171-465-0862 fax

Great Lakes Planetarium Assoc.
Susan Reynolds
Oneida-Cortland-Madison
B.O.C.S. Planetarium
P.O. Box 4774
Syracuse, New York 13221
(1) 315-433-2071
(1) 315-433-1530 fax
sreyold@ecnvm.cryric.org

Great Plains Planetarium Assoc.
April Whitten, Business Mgr.
Mallory Kountze Planetarium
60th & Dodge Streets
Omaha, Nebraska 68192 USA
(1) 402-554-2510
(1) 402-554-3100
awhitten@cvis.unomaha.edu

Italian Planetarium’s Friends Association
Loris Ramponi
National Archive of Planetaria
c/o Centro studi e ricerche Serafini Zani
via Borsa 24, CP 104
25066 Lumezzane (Brescia), Italy
(39) 817861
(39) 8275454 fax

Council of German Planetariums
Dr. Erich Uebelacker
Planetarium Hamburg
Hindenburgstrasse 01
D-22303 Hamburg, Germany
(49) 40-5149865-0
(49) 40-5149865-10 fax

European/Mediterranean Planetarium Association
Dennis Simopoulos
Eugenides Planetarium
Syngrou Avenue — Amfitheia
Athens, Greece
(30) 1-941-1181
(30) 1-941-7372 fax
dps@eugenides_found.edu.gz

Great Lakes Planetarium Assoc.
Susan Reynolds
Oneida-Cortland-Madison
B.O.C.S. Planetarium
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(1) 315-433-1530 fax
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Omaha, Nebraska 68192 USA
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(1) 402-554-3100
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National Archive of Planetaria
c/o Centro studi e ricerche Serafini Zani
via Borsa 24, CP 104
25066 Lumezzane (Brescia), Italy
(39) 817861
(39) 8275454 fax

Japanese Planetarium Society
Dr. Tadafumi Nakano, Director
The Science Museum of Osaka
Nakanoshima, Kita-Ku
Osaka 530, Japan

Middle Atlantic Planetarium Society
Fred Stutz
302 Beechgrove Court
Millersville, Maryland 21108 USA

Nordic Planetarium Association
Lars Broman
Bromma Planetarium
Ostra Hamngatan 1
S-791 71 Falun
Sweden
(46) 2310 177
(46) 2310 137 fax
lars.broman@planetarium.ac
http://www.nrm.se/om/xtra
Pacific Planetarium Association
Jon Elvert
Lane ESD Planetarium
2300 Leo Harris Pkwy
Eugene, Oregon 97401 USA
(1) 541-461-8227
(1) 541-607-6459 fax
jelvert@lane.k12.or.us
http://www.efa.org/~esd_plt/

Planetarium Association of Canada
Ian D. Cameron
Lockhart Planetarium
500 Dysart Road
Winnipeg, Manitoba R3T 2N2
Canada
(1) 204-474-9785
(1) 204-261-0021 fax
teamcern@cccc.umanitoba.ca

Rocky Mountain Planetarium Association
John R. Peterson, RMPA President
El Paso ISD Planetarium
6531 Boeing Dr.
El Paso, Texas 79925 USA
(1) 915-779-4316
(1) 915-779-4038 fax
johnp@tenet.edu

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The Marley and Scrooge Planetarium (A Planetarian Christmas Carol)

By
Charles Dickens

with the assistance of
George Reed
PO Box 9208
Incline Village, Nevada 89452

Stave One
Marley’s Ghost

Marley was dead, to begin with. There is no doubt whatever about that. Old Marley was as dead as a door-nail. Scrooge would have replied if asked, “Mr. Marley has been dead these seven years. He died seven years ago, this very night.” Scrooge had never painted out old Marley’s name. There it stood, years afterward, above the planetarium door: The Marley and Scrooge Planetarium. Scrooge probably didn’t want to buy the paint.

Oh! but he was a tight-fisted hand at the grindstone, Scrooge! a squeezing, wrenching, grasping, grasping, grating voice. He carried his own low temperature always about with him. He was cold as a doornail. Scrooge would have locked himself in; double-locked himself in, and passed into the room before his spirit ever roved beyond the narrow limits of our planetarium ledgers — mark me! — in life my spirit never roved beyond the narrow limits of our planetarium head count; and weary journeys lie before me!

I will,” said Scrooge.

“I am here tonight to warn you, that you have yet a chance and hope of escaping my fate. A chance and hope of my procuring, Ebenezer.”

“Your spirit never walked out of doors on any account? My spirit never walked out of doors on any account.”

“By Three Spirits.”

“It’s humbug still!” said Scrooge. “I won’t believe it!”

His color changed, though, when without a pause, it came on through the heavy door and passed into the room before his eyes. Upon its coming in, the dying flame leaped up, as though it cried, “I know him! Marley’s Ghost!” and fell again.

The same face, the very same. Marley, in his pigtail, usual waistcoat, tights and boots. The chain he drew was clasped about him like a tail; and it was made (for Scrooge observed it closely) of planetarium ledgers, and heavy planetarium cashboxes wrought in steel.

“How now!” said Scrooge, caustic and cold as ever. “What do you want with me?”

“Much!” — Marley’s voice, no doubt about it.

“Who are you?”

“Ask me who I was.”

“Who were you, then?” said Scrooge, raising his voice.

“In life I was your partner, Jacob Marley.”

At this the spirit raised a frightful cry, and shook his chain with such a dismal and appalling noise, that Scrooge held on to his chair, to save himself from a swoon.

Scrooge fell upon his knees, and clasped his hands before his face. “Mercy!” he said. “Dreadful apparition, why do you trouble me? Speak comfort to me Jacob!”

“I have none to give,” the Ghost replied. “It comes from other regions, Ebenezer Scrooge, and is conveyed by other ministers, to other kinds of men. Nor can I tell you what I would. A very little more is all permitted to me. I cannot rest, I cannot stay, I cannot linger any where. My spirit never walked out of doors; my spirit never roved beyond the narrow limits of our planetarium head count; and weary journeys lie before me!”

“Hear me!” cried the Ghost. “My time is nearly gone.”

“I will,” said Scrooge.

“I am here tonight to warn you, that you have yet a chance and hope of escaping my fate. A chance and hope of my procuring, Ebenezer.”

“You will be haunted,” resumed the Ghost, “by Three Spirits.”

“I — I think I’d rather not,” said Scrooge.

“Without their visits,” said the Ghost, “you cannot hope to shun the path I tread. Expect the first tomorrow, when the bell tolls One. Expect the second on the next night at the same hour. The third, upon the next night when the last stroke of Twelve has ceased to vibrate. Look to see me no more; and look that, for your own sake, you
remember what has passed between us.”

And Scrooge, from the emotion he had undergone, or the fatigues of the day, or his glimpse of the Invisible World, or the dull conversation of the Ghost, or the lateness of the hour, much in need of repose, went straight to bed, without undressing, and fell asleep on the instant.

**Stave Two**

**The First of the Three Spirits**

When Scrooge awoke it was so dark, that, looking out of bed, he could scarcely distinguish the transparent window from the opaque walls of his chamber. He was endeavoring to pierce the darkness with hisferret eyes, when the chimes of a neighboring church struck the four quarters. So he listened for the hour, which it now did with a deep, dull, hollow, melancholy ONE.

Lights flashed up in the room upon the instant and the curtains of his bed were drawn aside. Scrooge found himself face to face with the unearthly visitor who drew them.

“Are you the Spirit, sir, whose coming was foretold to me?” asked Scrooge.

“I am!”

The voice was soft and gentle. Singularly low, as if instead of being so close beside him, it were at a distance.

“When and what are you?” Scrooge demanded.

“I am the Ghost of Christmas Past.”

“Long Past?” inquired Scrooge, observant of its dwarfish stature.

“No. Your past.”

The Ghost put out its strong hand as it spoke, and clasped him gently by the arm.

“Rise, and walk with me!”

As the words were spoken, they passed through the wall and stood within a darkened planetarium with a large star projector at its center.

“Good Heaven!” said Scrooge, clasping his hands together, as he looked about him. “My interest in astronomy was bred in this place. I was a boy here! A thousand thoughts, and hopes, and joys, and cares long, long forgotten passed through his head.

“Your lip is trembling,” said the Ghost. “And what is that upon you cheek?”

“Nothing,” said Scrooge.

Pointing to the audience and the events taking place overhead, the Ghost said, “These are but shadows of the things that have been. They have no consciousness of us.”

The Spirit touched him on the arm, and pointed to Scrooge’s younger self, his heightened and excited face intent upon the stars overhead.

At the sound and sight of an old gentleman speaking and controlling the program while sitting behind a high console that if he had been two inches taller he would have knocked his head against the cove, Scrooge cried with uncharacteristic emotion and excitement: “Why, it’s old Fezziwig! Bless his heart: it’s Fezziwig, the planetarium director, alive again!”

It was old Fezziwig who had given him a chance to work as a volunteer at the planetarium. It was old Fezziwig who had taught him the stars and how to run the planetarium. It was old Fezziwig who had hired him as an assistant and started him on his way to a career in the same planetarium that would eventually be known by his name. And that of Marley. How he had loved old Fezziwig. He felt the Spirit’s glance, and stopped.

“What is the matter?” said the Ghost.

“Nothing particular,” said Scrooge returning to his usual demeanor.

“Something, I think?” the Ghost insisted.

“No,” said Scrooge, “no.”

The scene changed and an older, mature Scrooge stood by the side of a fair young girl outside the planetarium. She was an employee at the planetarium, in whose eyes there were tears, that sparkled in the light that shone out of the Ghost of Christmas Past.

“It matters little to you that I am leaving to work in another planetarium,” she said softly. “To you, very little. Another idol has displaced me; and if it can cheer and comfort you in time to come, as I would have tried to do, I have no just cause to grieve.”

“What idol do you think has displaced you?” Scrooge rejoined.

“A golden one. The admissions paid at the planetarium entrance.”

“Humbug,” said Scrooge in return. But he did not argue the point.

“My time grows short,” observed the Spirit. “Quick!”

Scrooge was conscious of being exhausted, and overcome by an irresistible drowsiness, and further, of being in his own bedroom. He barely had time to reel to bed before he sank into a heavy sleep.

**Stave Three**

**The Second of the Three Spirits**

The bell was again upon the stroke of One when Scrooge awoke in the middle of a prodigiously tough snore.

Now, being prepared for almost anything, he was not by any means prepared for nothing; and, consequently, when the bell struck One, and no shape appeared, he was taken with a violent fit of trembling. He soon noticed that he lay upon a bed, the very core and center of a blaze of ruddy light, which streamed upon it. He began to think that the source and secret of this ghostly light might be in the adjoining room, from whence, on further tracing it, it seemed to shine. This idea taking full possession of his mind, he got up softly, and shuffled in his slippers to the door.

The moment Scrooge’s hand was on the lock, a strange voice called him by his name, and bade him enter. He obeyed.

It was his own room. There was no doubt about that. But it had undergone a surprising transformation. The walls and ceiling were so hung with living green that it looked a perfect grove; from every part of which bright, gleaming berries glistened. The crisp leaves of holly, mistletoe, and ivy reflected back the light, as if so many little mirrors had been scattered there, and such mighty blaze went roaring up the chimney.

“Come in!” exclaimed the Ghost. “Come in! — and know me better, man!”

“I am the Ghost of Christmas Present,” said the Spirit. “Look upon me!”

Scrooge reverently did so. It was clothed in one simple, deep-green robe, or mantle, bordered with white fur. The Ghost of Christmas Present rose.

“Spirit,” said Scrooge submissively, “conduct me where you will. I went forth last night on compulsion, and I learned a lesson which is working now. Tonight, if you have taught to teach me, let me profit by it.”

“Touch my robe!”

Scrooge did as he was told, and held it fast as off the Ghost went, and Scrooge with him, holding on to his robe, to the Marley and Scrooge Planetarium. They arrived just as Bob Cratchit was moving out of an aisle with his son Tiny Tim upon his shoulder. Alas for Tiny Tim, he bore a little crutch, and had his limbs supported by an iron frame!

“Did you understand the space show, Dad?” asked Tiny Tim.

“Not really,” his father replied. “It had too many things to think about
with too little time to do so."

"I have a CD at home that's better," confessed Tiny Tim. "You can take your time with it. And I thought we were going to see stars."

"Didn't you see the stars during the show?"

"Sure, but they didn't talk about them or do anything with them. And you couldn't see them most of the time because of all the other pictures in the show. They could have shown the same show without stars!"

"Yes, well. I don't know why they didn't spend more time showing the stars," Mr. Cratchit confessed.

"My computer planetarium CD shows stars, but only on a monitor screen, and not all over the sky like outside at night. I thought the planetarium would do that. That's what I was hoping for, because the planetarium is the only place that can do that."

"Yeah, well. Did you like the Christmas show?"

"It wasn't as good as any of the TV Christmas shows this year," Tiny Tim replied.

As Bob Cratchit and Tiny Tim reached the operator console they stopped.

"Can you show us the stars?" asked Mr. Cratchit.

"We wanted to see the stars in tonight's sky so we could go out later and find some constellations or maybe a planet," added Tiny Tim with enthusiasm from his father's shoulder.

"I'm sorry," the operator replied, "but I only know how to turn the program on and how to rewind the show when it finishes. I really can't talk right now. I have to get ready for the next show. Maybe you can find a book to help you in the gift shop."

"Yeah, OK. Thanks," replied Mr. Cratchit.

"And Merry Christmas."

"God bless us, every one!" said Tiny Tim as the father and son exited the planetarium.

"Spirit," said Scrooge, with an interest he had never felt before, "tell me if Tiny Tim will return to the planetarium."

"I see two vacant seats in the planetarium if these shadows remain unaltered by the future, the child will not return. If these shadows remain unaltered by the future, none other of my race," returned the Ghost, "will find him here."

But the whole scene passed off in the breath of the last word spoken as the Ghost and Scrooge were again upon their travels. It was strange too, that while Scrooge remained unaltered in his outward form, the Ghost grew older, clearly older.

"Are Spirits' lives so short?" said Scrooge.

"My life upon this globe is very brief," replied the Ghost. "It ends tonight."

The bell struck Twelve.

Scrooge looked about him for the Ghost, and saw it not. As the last stroke ceased to vibrate, he remembered the prediction of old Jacob Marley, and lifting up his eyes, beheld a solemn phantom, draped and hooded, coming, like a mist along the ground toward him.

Stave Four

The Last of the Spirits

The Phantom slowly, gravely, silently, approached. When it came near him, Scrooge bent down upon his knee, for in the very air through which this spirit moved it seemed to scatter gloom and misery. It was shrouded in a deep black garment, which concealed its head, its face, its form, and left nothing of it visible save one outstretched hand. But for this it would have been difficult to detach its figure from the night, and separate it from the darkness by which it was surrounded. Its mysterious presence filled Scrooge with a solemn dread. He knew no more, for the spirit neither spoke nor moved.

"I am in the presence of the Ghost of Christmas Yet to Come?" asked Scrooge.

The Spirit answered not, but pointed onward with its hand.

"You are about to show me shadows of the things that have not happened, but will happen in the time before us," Scrooge pursued.

"Is that so, Spirit?"

"Ghost of the Future!" he exclaimed. "I fear you more than any specter I have seen. But as I know your purpose is to do me good, and as I hope to live to be another man from what I was, I am prepared to bear you company, and do it with a thankful heart."

It gave no reply. The hand was pointed straight before them to one little knot of administrators. Knowing them, Scrooge advanced to listen to their talk.

"It's likely to be a very cheap funeral, for, upon my life, I don't know of anybody to go to it. Suppose we make up a party, and volunteer?"

"Is there no one who feels emotion by this death?" inquired Scrooge, quite agonized.

The Phantom spread its dark robe before him andScrooge recollected in terror, for the scene had changed and now he was in a darkened room in the center of which, beneath a ragged sheet, illuminated by a faint light, there lay something covered up, which, though it was dumb, announced itself in awful language.

Scrooge glanced toward the Phantom. Its steady hand was pointed to the sheet which was so carelessly adjusted that the slightest raising of it, the motion of a finger upon Scrooge's part, would have disclosed its contents. Still the Ghost pointed with an unmoved finger to the sheet.

"I understand you," Scrooge returned, "and I would do it, if I could. But I have not the power. Spirit. I have not the power."

The Ghost of Christmas Yet to Come conveyed him as before until they reached a bulletin board full of announcements in a dimly lighted corridor outside the planetarium. The Spirit stood among the announcements and pointed.

Scrooge advanced toward it, trembling, his eye drawn to an announcement for a planetarium program, The Inner Universe -- A Voyage Through the Alimentary Canal, produced by a grant from the Internal Medicine Institute. Someone had written, "This show is off!" across the announcement. The Spirit then pointed toward another announcement.

"Before I draw nearer to that announcement to which you point," said Scrooge, "answer me one question. Are these the shadows of the things that Will be or are they shadows of the things that May be, only?"

Still the Phantom pointed toward the one announcement.

"Men's courses will foreshadow certain ends, to which, if persevered in, they must lead," said Scrooge. "But if the courses be departed from, the ends will change. Say it is thus with what you show me!"

The Spirit was immovable as ever.

Scrooge crept toward it, trembling as he went; and following the finger, read upon the announcement, "Due to budget considerations and years of declining interest and attendance, the Marley and Scrooge Planetarium will be closed. It will reopen as a multi-media theater as soon as the star projector has been dismantled and removed."

"Was that my star projector that lay beneath the sheet? Are the stars to be forever gone from the planetarium? Is the planetarium to be no more than a curiosity of the past?" he cried, upon his knees. "Good Spirit," he pursued, as down upon the ground he fell before it, "assure me that I yet may change these shadows you have shown me, by an altered life!

In his agony he caught the spectral hand. It sought to free itself, but he was strong in his entreaty, and detained it. The Spirit, stronger yet, repulsed him.

Holding up his hands in a last prayer to have his fate reversed, he saw an alteration in the Phantom's hood and dress. It shrunken, collapsed, and dwindled down into nothing.

Stave Five

The End of It

And so, as Tiny Tim observed, God Bless Us, Every One!
A New Planetarium Captioning System for the Hearing-Impaired

Noreen Grice, Education Associate
Charles Hayden Planetarium
Science Park
Boston, Massachusetts 02114
grice@al.mos.org

In 1990, the Americans with Disabilities Act (ADA) was signed into law. It stated that reasonable accommodations must be made for persons with disabilities. Examples of "reasonable accommodations" may include providing Braille restroom door plates, wider aisles in supermarkets, and picture-menus in restaurants. For planetariums, ADA compliance can include Braille star maps, removable seats, empty spaces for wheelchairs, or providing scripts to hearing-impaired visitors.

I'd like to describe our newest accommodation, a captioning system for the deaf, and outline some of the steps we took to improve our accessibility for hearing-impaired patrons.

Since 1988, I've produced Braille astronomy materials for our planetarium and worked with staff of the Museum of Science, Boston, to improve accessibility for visitors with disabilities. I'd like to describe our newest accommodation, a captioning system for the deaf, and outline some of the steps we took to improve our accessibility for hearing-impaired patrons.

In the mid-1970s, the planetarium staff constructed a wooden, 3-sided booth for sign-language interpretation. The interpreter, who sat on a folding chair inside the booth, was illuminated by a gooseneck lamp with a 25-watt red bulb. The booth was strategically placed in a specific section of the theater where deaf patrons were asked to sit. The Museum provided interpretation on the second Saturday of every month.

In 1993, Bridget Shea described a captioning system at the Davis Planetarium in Baltimore which projected Kodakith text captions on the wall, below the dome. Two slide projectors and a dissolve unit were mounted behind the dome and programmed so that the presenter could easily reach them before the show. The unidirectional seating allowed the audience to easily read the text during the show. In 1993, the Davis Planetarium hosted the MAPS meeting and we were treated to a demonstration of their captioning system.

How could Boston's planetarium improve on accessibility for deaf visitors? First we looked at our interpreter booth. It was rigid, required two people to carry it into the theater, and it was looking a little shabby.

We experimented with the captioning box for almost a year. The slides often got out of synch and one of our staff was required to monitor them and to make necessary "adjustments" by manually operating the projectors. Even with two dark gels on the slide projectors, the light leak obscured most of the southern sky. Patrons who used the system appreciated our effort but had difficulty watching the text and turning their heads to watch the show.

In addition to our work with the captioning box, we also experimented with devices to amplify volume for hearing-impaired visitors. We purchased a Whisper 2000 amplification unit from a local department store. Patrons requiring volume control borrowed the unit during the show. The device often produced loud feedback and not only amplified the show, but also nearby conversations.

We removed the Whisper 2000 unit in 1994 upon receipt of a grant from The Peabody Foundation, Inc. and purchased a Williams Sound Corp. FM Hearing Assistive System. Twenty units, including three with special adapters for hearing aids, receive output from a transmitter in the control room which allows hearing-impaired patrons to independently adjust the volume to the desired level.

With some suggestions for portability, the Museum's Exhibits Department fabricated a new booth which could be wheeled by one person and easily used in the Planetarium, Omni Theater or any other area where it was needed.

Next, we tried to recreate the captioning system used at the Davis Planetarium. Since our theater has concentric seating, it was not practical to illuminate captions below the dome. Instead, our technicians fabricated a one-meter tall "captioning box" which housed two slide projectors and a dissolve unit. The slides were programmed into the show so they would always be available. When needed, the captioning box was wheeled into the theater and stationed at the center of the aisle in the south. A white poster board was attached to the Zeiss pit with Velcro, and deaf visitors were required to sit in the first two rows, closest to the poster board.

Noreen Grice holds a VFD captioning unit.
In the fall of 1993, I attended a demonstration of three prototype captioning devices, coordinated by the WGBH Captioning Center in Boston. Both hearing and hearing-impaired persons attended the demonstration and were encouraged to try all three devices while a Clint Eastwood movie was playing in the cinema. The first device (Virtual Vision) was a pair of "high-tech" glasses which displayed captions in a tiny monitor over the right eye. The person’s left eye was required to watch the movie from a distance while the right eye watched a close view of the captions. A majority of the people put the device away after a few minutes because it produced a dizzying effect!

The second (rear view) device was a large construction LED sign mounted in the rear of the theater with large illuminated reversed text. Certain seats housed a rectangular Plexiglas sheet affixed to the arm rest by a gooseneck attachment. Thus, the text appeared non-reversed when reflected in the Plexiglas and the gooseneck allowed the Plexiglas to be adjusted below the level of the movie screen. This set-up works very well for unidirectional seats and was recently installed at the Langley Imax Theater at the National Air & Space Museum. Unfortunately, this system would not work in a concentric seating theater such as ours.

The third device, called a VFD (Vacuum Fluorescent Display) was a rectangular monitor shaped like a shoe box and attached to the backs of several chairs. The hearing-impaired person sat behind the device to read the displayed captions which were hard-wired to a PC in the rear of the theater. The VFD devices consistently scored highest among users in comfort and ease of use.

The Peabody Foundation Inc. again funded our grant request, this time to develop and install a captioning system using the VFD technology of the WGBH Captioning Center in Boston. I approached Design Continuum of West Newton, Massachusetts, a local design and engineering company, with my idea and they agreed to donate the research, design and engineering of the system pro bono. Designers from the company and I met several times while they conducted ergonomic studies by measuring the planetarium seating for optimum viewing angles.

An important consideration was in making the system modular so that devices would be installed on an as needed basis. The devices had to be easily and quickly installable, since in most cases they would be used without advance notice. The captioning units needed to be modular. The engineers developed ideas on how to redesign the VFD housing and how to attach the units to the seats.

After careful studies of our planetarium chairs, the engineers at Design Continuum came up with an alternate means to mount the display units: attach a bent beam of steel to the end of an aisle seat to use as a support for the VFD monitor. The top of the beam houses a removable metal cap which the VFD unit can slide into as needed. When a VFD unit is not needed, the contour of the beam blends in with the end of the chair and it is virtually invisible.

The beam is wired behind the planetarium dome and into the control room to a 486-PC. Special captioning software from WGBH Boston is used. The captioning software was developed by the CPB/WGBH National Center for Accessible Media with funding provided by the National Institute for Disability and Rehabilitation Research. The PC receives SMPTE code from the SPICE automation system and relays it to the VFD units in the theater.

The world premier of the new captioning system occurred on May 10, 1996, at the Middle Atlantic Planetarium Society (MAPS) Conference in Boston. Shortly thereafter, the captioning system became available to the general public and is advertised on Museum programs and through signage in the Planetarium lobby.

We offer two programs for the general public; a partially taped show (currently called “Cosmic Update!”) and a live show (“The Sky Tonight”). Captioning is available

(Please see Captioning on page 64)
Exploiting an Opportunity: The Diorama Displays at the Carter Observatory

Wayne Orchiston and Richard Hall
Carter Observatory, PO Box 2909, Wellington, New Zealand
“Wayne.Orchiston@vuw.ac.nz”

Introduction
The didactic role of science sciences has long been recognized (e.g. Danilov, 1975; 1982), and according to the International Council of Museums, planetaria and public (as opposed to purely research) observatories should be viewed as special types of science centres.

One of the most attractive features of contemporary science centres is the tantalising range of communication media that is used to bring science and technology to the general public in enlightening, entertaining and non-threatening ways. One such medium is the display, and interactive displays in particular have been found to be user-friendly and educationally effective (Eason and Linn, 1976; Fierro, 1996; Linn, 1976; Screven, 1974; Thier and Linn, 1976). To exploit this opportunity, some observatories and planetaria have developed interactive display galleries (e.g. see Lomb and Wilson, 1992), while others have sought to combine interactives with more traditional static displays along the lines of the “science centrum” concept outlined by Orchiston and Bhathal (1984).

Perhaps the most visually appealing of static displays is the diorama (from the Greek dia = through, and orama = scene, view), which is very popular with visitors (ROM, 1976). Dioramas aim to communicate scientific concepts through a reconstructed three-dimensional physical environment, where one or a number of habitats, microenvironments or cultural settings (depending on the focus of the exhibit) is depicted. Imaginative lighting and other “special effects” can dramatically enhance the realism of such displays. The ideal diorama is a life-size walkthrough, but most institutions lack the space and resources to establish and maintain these. Instead, they opt for smaller-scale life-size dioramas in display cases or miniaturised dioramas. This paper discusses the diorama displays prepared at the Carter Observatory to support our new planetarium programs.

Carter Observatory is the National Observatory of New Zealand, and it was opened in December, 1941 (see Orchiston and Dodd, 1995). It is located in Wellington, the nation’s capital, and currently has four different functions:

To conduct astronomical research of international significance,
To provide a national astronomy education service for school children, teachers and trainee teachers,
To provide a national public astronomy service for New Zealand residents and visitors to New Zealand,
To assist in the preservation of New Zealand’s astronomical heritage.

Since 1992 the Carter Observatory has undergone major restructuring as a result of government policy changes, and it has acquired an aging Zeiss planetarium, a new visitor centre, and a number of new staff. As a result there has been a total revamping of the education and public astronomy operations (see Leather et al, 1996; Leather et al, 1997; Orchiston, 1995; Orchiston and Andrews, 1995; Orchiston and Dodd, 1996; Orchiston et al, 1996).

Wayne Orchiston is the Executive Director of the Carter Observatory. He has research and tertiary teaching backgrounds in astronomy, prehistory, paleoanthropology, geology and museology, and has B.A. Hons. and Ph.D. degrees from the University of Sydney.

Richard Hall is the Public Programs Officer at the Carter Observatory and is responsible for the production of new planetarium programs and audio-visual shows. He is a practising artist and a qualified electrician, and has a B.Sc. degree from Victoria University of Wellington.

Diorama Displays at the Carter Observatory
When the Carter Observatory was presented with the aging Zeiss planetarium and new visitor centre in 1992 it also inherited a number of thematic planetarium programs that had been generated locally during the 1970s and early 80s. One of the first challenges was to plan appealing new, up-to-date planetarium programs, and a decision was made to use these as the focus of a total public astronomy package which would also include associated displays and publications. Two different diorama displays were prepared in support of the Observatory’s first two new planetarium programs.

Each was designed to serve as a “feature” display, and each was positioned at the rear of the foyer in the visitor centre (see Figure 1) so as to attract the attention of those arriving at the entrance door and also to offer those who had just seen a related planetarium program an immediate second viewing opportunity.

The Dinosaurs Diorama
During 1993, the movie Jurassic Park set box-office records around the world at precisely the time the Observatory’s then Information Officer, Graham Blow, was developing the Observatory’s very first planetarium program. With this fortuitous timing, “Death of the Dinosaurs” was the obvious theme, and this allowed us to cater to the enormous public demand for information about dinosaurs and in the process examine the various theories advanced for the Cretaceous mass extinction event (with emphasis on (but not a total commitment to) the asteroidal impact scenario). This 40-minute show was launched on 1993 December 26, and proved exceedingly popular.

Two separate displays were planned to complement “Death of the Dinosaurs”: the diorama in the visitor centre and a small conventional wall panel and tabletop case display in the adjoining theatre (see Figure 1). The first author was responsible for the latter display, while the second author prepared the diorama (with assistance from a builder and part-time member of staff). Both were designed to be didactic as well as entertaining (see Brunello, 1992; Parker, 1995).

The diorama (Figure 2) had maximal dimensions of 3m by 2.5m by 2m, and showed a reconstructed Cretaceous landscape, complete with model dinosaurs, and the in-coming asteroid which supposedly led to their extinction. The starting point was the preparation of concept design drawings of the display, including a detailed coloured sketch in pastels of the painted canvas back-
role as Public Programs Officer! Such an approach has been used to great effect in overseas science centres, and was successfully trialed by the first author during five years as director of a regional New Zealand museum prior to his coming to the Carter Observatory.

While the backdrop was being painted in the corridor a part-time staff member was busy in the foyer assembling the wooden framework for the front section of the display, using particle board for the sides, front, and the flat “table-top” on which the Cretaceous landscape would be developed.

The canvas was then installed and curved forward so as to merge with the front section of the display. The foreground landscape was then built up using a combination of plaster and sculptured foam rubber. The latter provided a very realistic surface texture, especially for rocky outcrops and cliff sections. Once the terrain was complete, the entire landscape was painted. Final touchups to the landscape then took place, particularly where the background canvas merged into the foreground, and by painting in and modelling a longitudinal cliff an excellent impression of 3-D continuity was generated. Some final touching up of the vegetation in the mural was also necessary, so as to emphasize individual trees along the nearby riverbank (see Figure 3).

The last stage in the preparation of the diorama was to install the foreground vegetation, using an assortment of dried twigs, branches and other “bits and pieces” found on local beaches. These props and the model dinosaurs were painted in colours that matched their new “habitat” before they were finally positioned in the display (Figure 4).

Given the Observatory’s non-existent track record in preparing displays, the final result was very pleasing. Although in miniature, the landscape looked very realistic, and the painted background merged so unobtrusively into the modelled foreground that visitors could not identify where the two joined. Furthermore, the amount of detail portrayed in the diorama was truly amazing, but this was essential given that the display was designed to be viewed from very close range.

While the second author prepared the diorama, the first author prepared a simpler supporting display titled “Dinosaurs of New Zealand” in the adjacent Theatre (see Figure 1). Although the Theatre was used at that time for on-going videotape shows, static panel displays had been set up on both of the long walls in this room. The dinosaurs display would therefore add to the range of displays available to visitors and at the same time provide information on a little-known fact: that dinosaur remains had, indeed, been found in New Zealand (e.g. see Cox, 1991; Wiffen, 1991). And finally, through the “Death of the Dinosaurs” planetarium program we had an excuse to broaden our display horizons beyond the narrow confines of...
astronomy and astronautics, thereby appealing to a wider client-base.

The Theatre display employed an old tabletop display case and two associated information panels on the adjacent wall. The case contained casts of dinosaur fossils, actual fossils of other species found in the same lithostratigraphic units, and drawings showing suggested reconstructions of some of the different types of dinosaurs found in New Zealand. Most of the specimens were kindly loaned by Dr. Wiffen and the Hawkes Bay Museum (with due acknowledgement in the display itself).

The wall panels contained biographical information about Joan Wiffen (including a colour photograph) and provided data on Hawkes Bay formations about Joan Wiffen (including a colour photograph) and provided data on the diverse fauna and flora of the region. The wall panels also contained casts of dinosaur fossils, actual fossils of other species found in the same lithostratigraphic units, and drawings showing suggested reconstructions of some of the different types of dinosaurs found in New Zealand and their antiquity. The two information panels were laminated for protection.

The S19 Diorama

The replacement planetarium show for "Death of the Dinosaurs" was "Worlds in Collision" which was inspired by the anticipated impact of a much fragmented Shoemaker-Levy 9 (henceforth SL9) with Jupiter in mid-July 1994. We knew that this event was bound to attract enormous media attention and to take advantage of this we scheduled the launch of the new show two weeks before the "grand event".

On this occasion, a "Worlds in Collision Project Team" (the two authors and five other full- and part-time staff members) was formed to prepare the following "package":

- the 40-minute planetarium program (July)
- a 2-page A4 size Information Sheet about SL9 and the impacts (July)
- "Project Jupiter", comprising 12 successive special evenings (involving an up-to-date talk (revised each day and incorporating the latest images of the World Wide Web), the planetarium program, and observing with the historic 23cm refractor), during and immediately after the SL9 impacts (July)
- a single diorama display (July)
- a general solar system panel display (to go on new display boards partitioning off part of the Theatre), but including giant colour blow-ups of some of the SL9 impact sites, and information on the Galileo Probe (August)
- a 3-D scale model of the Probe (prepared as a secondary school project), to be suspended from the Theatre ceiling near the new panel display (October)
- a 30-minute audio-visual show titled "Galileo: A Space Odyssey", to screen continuously in the Theatre (October)

The various components listed were launched, completed or implemented over a three and a half month period (during the months shown in parentheses) in order to "drip-feed" a range of new product to the local client-base and encourage their return visitation. In addition, given the resource limitations of the Observatory, such an extended time-frame was vital if we were to bring this ambitious Project to fruition.

The "S19 Diorama" was completed in late-July, immediately after the "Project Jupiter" sessions (when it would have caused far too much visitor congestion in the foyer). It showed Jupiter and the in-coming "comet train" as viewed from the surface of Io. A new canvas was kindly supplied by Websters, and was again painted by one of the authors (R.H.), while the dinosaurs' Cretaceous landscape was substantially remodelled to depicting Io, with its active volcanoes, pools of sulphur and dormant volcanic fumaroles. The same modelling ingredients, stiff foam rubber and plaster (again from the Plaster Warehouse), were used to great effect to produce a rugged alien landscape which was finished with paint from ICI Paints in assorted hues of brown, yellow and orange, with blue-black sulphur lakes. The completed diorama was visually captivating.

Discussion and Concluding Remarks

Both Carter Observatory dioramas were free-standing; they were not in displays cases or behind protective barriers of any kind as it was important that visitors should be able to gain close-up views of the landscapes depicted. Nor were they accompanied by "Do Not Touch" signs. In the museum profession it has been shown that when the respect and integrity of visitors is recognised they rarely betray such trust, and this proved to be the case at the Carter Observatory for neither diorama suffered any significant damage.

It is important to note that neither diorama could have been built without the support of the business sector. Despite our limited financial resources, through effective networking, by promoting the Observatory's public astronomy programs as a quality "product" of obvious market appeal and by using the multifarious backgrounds, skills and talents of our own staff, we were able to bring to fruition two diorama displays which would otherwise have cost tens of thousands of dollars if contracted out to commercial display firms. To express our appreciation, after the completion of each diorama we ran a special "Sponsors' Night" for the friends and families of those associated with the sponsoring firms. We also made a point of mentioning all our sponsors on the 2-page A4-sized Project Information Sheets that was handed to all visitors. Clearly, sponsorship and staffing emerge as two critical elements in the strategic planning of public observatories and planetariums with limited budgets.

Figure 3: Close-up showing finishing touches along the nearby river bank.
The public response to both of our dioramas was excellent, in part because of the support of the local media. Our media releases led to favourable reports in a number of local (particularly suburban) newspapers, but our greatest media "coup" would have to be the feature article about the dinosaurs diorama, complete with colour photograph, which appeared on the front page of one of New Zealand's leading national dailies, the Evening Post, on Christmas Eve 1993 (next page). This clearly illustrates the benefits to be derived from actively promoting new public astronomy initiatives during what those in the media facetiously refer to as "the silly season", but whatever the time of year a new display is mounted, media support is vital if it is to draw maximal audiences.

One of the other developments which went hand-in-glove with the construction of the dioramas was to source appropriate stock for the Observatory's "Space Shop". For example, those viewing the "Death of the Dinosaurs" display could select from a range of books, pamphlets, posters, stickers, holograms and small "glow-in-the-dark" dinosaurs. Of these, the little model dinosaurs proved extremely popular (and continue to be so, long after the display was dismantled). Merchandising should be an integral part of the display planning process.

We believe that displays, and not necessarily just diorama displays, should be seen as part of the total communication package of public observatories and planetaria. They are not difficult to fabricate and they need not be prohibitively expensive. Even where staff of an observatory or planetarium lack the requisite range of skills, by approaching local schools, individual artists or artists groups, universities and/or polytechnics, and by networking with the media and the business sector, what we have done in Wellington, New Zealand, can be readily replicated in most other cities around the world.

Our formula — in an impoverished financial environment — for the optimal success of an astronomical display (D), regardless of type, is

\[ D = 4S + 2P \]

Where possible, displays should be taken advantage of anticipated heightened public awareness: they should be topical and therefore timing, or scheduling (one of the "S"s), is critical. If there are financial limitations, as there often are in observatories and planetariums, then obtaining adequate and appropriate sponsorship (a second "S") is essential. If display budgets are limited then multi-talented staff (a third "S") are vital. Between them, they should be able to combine the attributes of the graphic designer, artist, carpenter, plasterer, welder, sign-writer, photographer, painter, electrician, lighting engineer, conservator (and with interactive displays, computer programmer and electronic technician). All of this, however, is for nought if the final product does not exhibit a professional finish and prove entertaining, visually stunning or at very least stimulating (the final "S") to the visitors. Converting local populations and tourists (domestic and international) into actual visitors is about effectively promoting (the first "P") the institution and its attractions, through a carefully planned and executed media campaign.

Finally, in order to gain optimal visitor response, whenever possible a display should be planned as part of an overall communication package (the second "P") involving a combination of other elements, such as: planetarium programs; audio-visual shows; video screenings; publications; media presentations; public lectures, workshops or seminars; special viewing nights; and other associated displays. And because the shop or sales counter has an important informational role, it should also be seen as part of this package, and not merely as a source of revenue.

Finally, what of the future for dioramas at the Carter Observatory? When the second (SL9) diorama was prepared, it was part of a total revamping of the visitor centre foyer. The first phase was to restrict natural lighting, paint the walls and ceiling "sky" black, and adorn them with attractive astronomical murals (again with sponsorship from ICI Paints). The second phase called for the relocation of the entry desk to a central position, refurbishment of the Space Shop, removal of the diorama and the painting of an astronomical mural across the full length of the back wall of the foyer. With the relocation of the desk and the establishment of separate and exit routes, to maintain the diorama would have drastically disrupted the visitor flow. The SL9 diorama was therefore removed in 1995 with the opening of the new planetarium show "Journey to the Centre of the Galaxy", and a stunning mural now adorns the wall.

The diorama displays which graced the foyer during 1994 and 1995 were very popular with visitors, and it is much to be regretted that other priorities (particularly relating to expanding the shop) made it necessary to abandon these. The long-term plan is to substantially increase the size of the presently very constricted visitor centre (see Orchiston et al., 1996), and when this eventuates diorama displays will once more become a feature of the Carter Observatory.

Acknowledgements

We are grateful to Walter Jobstl for helping with the construction of both dioramas; to our sponsors Benchmark Building Supplies, G. Webster and Company, ICI Paints, the Plaster Warehouse, and Stewart Sales and Services for making these dioramas possible; to Dr. Joan Wiffen and the Hawkes Bay Cultural Trust for kindly loaning specimens and casts of dinosaurs and other fossils; and to Frank Andrews for photography.

Figure 4: The "Dinosaurs of New Zealand" panel and tabletop display
References
Low Budget Laser Light Show

In the fall of 1972, during the International Conference in Cupertino and in the Minolta Planetarium on the DeAnza College Campus, I introduced the idea of using student held red flashlights as a means of illuminating student notebooks. It was, also, demonstrated how the red spots of light could serve as student response pointers (Planetarian, June 1973).

Years later, while working with earth science and astronomy classes at St. Petersburg Junior College, I would conclude the lecture by saying, "Later, as you leave the planetarium theater, have the flashlights turned on as you hand them to me. I will turn them off."

"For now, the stars and house lights will be turned off. Turn on the flashlights and shine them on the dome. Wiggle them around on the dome—move them quickly, all over the dome."

Then, with a stentorian voice, I would say, "L-aaa-dieees and Gentle-men, presenting to you, Mr. Perkins' Low Budget Laser Light Show!"

The audience usually exited with a set of smiles and chuckles as each put a warm flashlight into my hands.

Tom Sawyer Series

At the request of a teacher and the mentor inspiration of a planetarium educator, a two part series based on The Adventures of Tom Sawyer was begun.

The eighth grade English teacher, Joyce Moore, had asked, "What could we do about the 'star-studded sky' (star-gemmed) that Tom Sawyer, Huckleberry Finn and Joe Harper saw as they crossed the river on the raft over to Jackson's Island?"

About the same time, I read in the Great Lakes Planetarium Association's Newsletter, Fall 1971, an article by Dave DeBruyn describing a way to make semi-circular to nearly circular brute force projectors. Immediately, I thought of stalactites hanging down from the planetarium caved ceiling.

Tom Sawyer's Raft

As the students entered the planetarium, all was dark except for the starfield set for a mid-summer midnight at 40 degrees north latitude.

There were crickets chirping and the light was a small lantern held upright by a small post in the center of the planetarium chamber.

A narrator's voice started the story telling how the boys met at midnight, boarded the raft, and shoved off the bank. As they did, the lantern started moving back and forth and the starry sky moved back and forth oppositely.

The lantern was moved by a barbecue rotisserie motor with a crankshaft and a connecting rod. Starfield motion was produced by alternate changes of the latitude shaft.

The cricket sound stopped as the narration took the raft to the island and the motions stopped abruptly as the crickets began again. Cricket sounds were dubbed from a sound effects record from Viewlex onto a six foot length of quarter-inch, reel-to-reel tape with the ends fastened together and running onto an array of sewing machine bobbins as pulleys supported by coat hanger wires.

As the narration told of the boys' cooking their supper of stolen ham and bacon, the smell of smoked meat wafted through the star-and-lantern-like environment.

A scrap of toweling that had been held above a pan of frying bacon provided the aroma. The towel had been covered by a plastic bag suspended in front of a window box fan. As the fan motor started, the breeze blew away the bag and brought about the smoky aroma.

Soon, the boys fell asleep and the crickets hushed as the stars and the lantern faded to darkness.

We had pondered the idea of adding the aroma of Huckleberry's tobacco smoke but we abandoned the thought.

Tom Sawyers' Cave

A week later, the waiting class of eighth graders were asked, "Did you enjoy last week's adventure with Tom Sawyer?" The all agreed, "Yes!"

"Would you like to go on another adventure with Tom Sawyer?" "Yes!"

"Follow me."

Alongside the planetarium door was a crudely lettered sign that said: McDougall's Cave.

As the right side of the double door opened, it revealed a stage flat horizontally streaked with gray and brown paint looking like limestone strata. At the bottom was an inverted V opening just big enough to crawl through.

I entered first crawling through the tunnel—two large console television boxes placed end to end. At the end of the tunnel, I waited, crouched. As the students emerged from the tunnel, I would grasp them by the upper arm and whisper, "Relax; find a seat and be quiet." "Relax, find a seat and be quiet."

The only light was small, orange, flickering, candle-like bulb mounted in an enlarged plywood candle stick resting under the legs of the star projector.

After the last person was seated, I would pull the two cardboard boxes away by means of convenient rope handles, close the door and feel my way to the console.

As the narration and conversation began, the brute force projectors displayed stalactites hanging in a 360-degree circle.

Tom and Becky Thatcher's voices sounded with a resonance. Their voices had been recorded with part readers' standing on the star projector pedestal with their heads near the central focus of the planetarium dome.

Before Tom fished around in his pockets to find the kite string, he found a piece of leftover wedding cake. At that moment an electric fan was turned on and soon the smell of the vanilla flavoring of the wedding cake icing was wafting through the darkened planetarium cave.

Soon their candles burned out and the electric candle lamp was dimmed off.

The chapter ended after Tom, threading his way with the kite string, saw an opening and a little speck of daylight. In the planetarium cave, it was a piece of black construction paper with a pinched out hole and a bit of blue colored filter with Tom's whispering, "I see a hole. It's light," and then shouting, "Becky, I see a hole! I see the Mississippi" and Becky's sighing, "Ooh, Tom, we're saved. We're saved."

The house lights came up and the English class students went back to reality.

Epilogue. The Tom Sawyer's Cave program was part of a VIP presentation to community leaders and school administrators showing what could be done in the planetarium heralded as a "multi-media laboratory." After describing the VIP presentation to a conference audience of planetarium educators, it was facetiously said that "Ken Perkins was one planetarium person that had his administrators crawling on hands and knees."
Focus on Education

Follow the Drinking Gourd (II): A Participatory Alternative for Planetarians

Stu Chapman
Southampton Planetarium
Harford Co. Public Schools
Southampton Middle
Moores Mill Road
Bel Air, Maryland 21014
http://www.accessdigex.net/schapman

One of the best children's planetarium programs to evolve in the last few years on the educational front has been the Drinking Gourd program based on the children's book by Jeannette Winter and introduced into the planetarium community by Gloria Rall of the New Jersey State Museum Planetarium. The program, which is suitable in various versions for grades 3-5 in the United States, relates the story of how slaves used the underground railroad to migrate northward to freedom. To aid them in their journey, they used the "pointers" of the Drinking Gourd (i.e., the Big Dipper) to identify the north star. Along the way, they sang the song, Follow the Drinking Gourd, from which the program gets its title. Today, you can order a set of over one hundred slides from the New Jersey State Museum Planetarium, with an audio cassette tape, Production Guide, and Educator's Guide for your planetarium for under one hundred and fifty dollars! Without question, this is one of the best opportunities on the market for production to the education community.

Many planetarians in the United States have chosen to offer this program during February, which is black history month, although the program can actually be successfully implemented at any time of the school year. In our school district, here in northern Maryland, the topics of the underground railroad, mapping skills, and black history month were already part of the third grade curriculum, where my wife, Karol, is a classroom teacher. Karol and I decided to use the excellent work done by Ms. Rall to produce one of no doubt many alternative versions of this program which is highly participatory. We began with the goal to involve every student in a single class setting (thirty or less) with an opportunity to actively participate by using the pointer flashlight during the program's delivery. Karol wrote pre-planetarium and post-planetarium lessons for the attending teachers to implement before and after the visit in which the students were taught some of the geography needed to understand what was occurring during the imaginary journey. She then composed a planetarium post-visit lesson in which students were given the opportunity to "construct meaning" from their planetarium observations, a higher level thinking skill - and one of the ambitious goals of the Maryland School Performance Program. With Black History month on the horizon as this issue comes to print, we would like to share our version of the Drinking Gourd program with the readership this month. One last thing: If you decide to try this program, don't forget your costume! You will get to play the part of Peg Leg Joe! You will need an old coat, baggy pants, an artificial beard (unless you elect to grow the real thing), and a hat to wear. You will also have to fashion some kind of fake peg-leg. I used a big piece of cardboard wrapped into a cylinder worn from the ankle to the knee. I painted the outside of the cardboard to resemble a wooden leg. Although it worked pretty well (the teachers loved it!) the kids were smart enough to know it wasn't real because they could see my foot protruding from the bottom!

**Materials (Pre-Planetarium)** The music teacher will need the audio cassette of the Drinking Gourd Song with the lyrics and melody. The classroom teacher will need the children's book, Follow the Drinking Gourd. These items may be ordered for use by the home school or may be borrowed from the planetarium prior to the date of the visit.

**Materials (Planetarium)** On the date of the planetarium visit, each student will need the enclosed worksheets, Follow the Drinking Gourd (Constellation Clues) and a pencil. Clipboards to hold the students' worksheets will be provided at the planetarium.

**Materials (Post-Planetarium)** Students will need the enclosed map of the Eastern U. S. entitled, Planetarium Post-Visit: Follow the Drinking Gourd and the enclosed chart, Follow the Drinking Gourd Post-Visit Latitude Chart.

**Advance Preparation** (for planetarium day) In addition to duplicating the enclosed worksheets entitled Planetarium: Follow the Drinking Gourd (one for each student - front & back may be used), teachers should divide their class into six cooperative groups who will be seated together on planetarium day. The worksheets may be brought to the planetarium for distribution as the students are being seated.

**Cross Curricular Connection:** Integrated Language Arts, art, music, social studies (history and map skills)

**Science Thinking Skills:** identifying, observing, recalling, describing, categorizing, classifying, comparing, visualizing, finding main idea.

Harford County Public Schools Planetarium
Follow the Drinking Gourd

by Stu Chapman

Classroom Activities by
Karol Chapman

Computer art by Rod Martin,
Washington County MD Public Schools

Outcome: Students will discover how a circumpolar constellation (the Big Dipper) and the north star were used in land navigation.

**Essential Learning:** Students will be able to distinguish the north star from other stars in the sky, using a constellation cue.

**Class Time:** Several class periods will be involved. Students will need to spend two class periods with their music teacher, learning the lyrics and singing the Drinking Gourd Song. At least one class period will be required prior to the planetarium visit with the regular teacher for the reading and discussion of the children's book, Follow the Drinking Gourd by Jeannette Winter. The actual planetarium lesson will be at least fifty minutes in length plus the time required for bus transportation. Finally, at least one classroom period following the planetarium visit should be allocated for the post-planetarium activities included with this lesson. There is ample opportunity for those teachers and students whose curiosities are piqued to complete several enriching post-planetarium activities by using the newly gained knowledge meaningfully through library investigation.

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Planterian
Background

In the classroom preparation, students will acquire and integrate new knowledge as the teacher "shares" the book entitled *Follow the Drinking Gourd* by Jeannette Winter. The students will discover the subject of slavery, understanding that in the face of danger and even death, people wanted their freedom. The simple folk song in this lesson, sung by the slaves, gave the clues to a map to freedom, for hidden in the lyrics were the directions for a trail known as the underground railroad. Then, in the planetarium, students will extend and refine knowledge by inducing, abstracting, comparing, and classifying based on the observations of the constellations being used for the underground railroad. After the planetarium visit, as an extension, the students will use this newly gained knowledge meaningfully by completing a map and chart which resolves how these historical events might have occurred. Productive habits of mind will be established as students have the opportunity to investigate further information from library references and literature about how the constellations were used as people charted their path to freedom.

Before the Planetarium Visit

Please ask the music teacher to use at least two music periods to teach the students the lyrics and to practice singing the *Drinking Gourd Song* with the class.

The students' regular teacher should use one class period to read the book, *Follow the Drinking Gourd* to the class.

The Planetarium Lesson

As the students enter the planetarium, the planetarium teacher shall seat them within their cooperative groups. The attending teacher will distribute the worksheets. As darkness descends, the class will be singing the Drinking Gourd Song with the planetarium teacher.

One member of each cooperative group will then be asked to come to the front of the room to obtain their hidden constellation clue from the hole in the (cardboard) tree which contains the secret left-foot and peg-foot of Peg-Leg Joe. The constellation clue will be used, with the planetarium teacher's help during the lesson. *Note to planetarians*: the constellation cue can simply be a black line sketch of one of the six constellations shown on the worksheet. The cue should be large enough to cover the entire sheet of paper. Each group will know at the beginning of the lesson which of the six constellations they will be expected to find when it is their turn.

The class will then begin a fictional journey beginning at the mouth of the Tombigbee River in southern Alabama, northward to Canada and freedom. The journey will take about seven months (from early spring in April until late October in the fall). The class will notice, that as the months and seasons change, so do the star patterns seen in the night sky. The class will observe the changing constellation and star patterns at six different locations along the way. While pretending to camp at specific locations during the journey, each of the six cooperative groups will have the opportunity (with the help of the planetarium teacher) to find their constellation from the constellation cue card on the planetarium dome and to point out its location for the rest of the class with the pointer flashlight. Then, with the planetarium teacher's help, the whole class will be directed to look north to locate the drinking gourd and the north star. The class will observe that the drinking gourd also changes position with the seasons (an item not addressed in the Winter book), while the north star remains fixed in the same position. The planetarium teacher will then use the meridian projector for the class so that the altitude (angle with the horizon) of the north star can be easily measured. Then, the lights will be raised so that each student can write down the altitude of the north star in the appropriate box on their planetarium worksheet for later classroom use. As the lights are again lowered, one member of the cooperative group will again be asked to point out the location of the drinking gourd for the rest of the class. The planetarium teacher will encourage the class to try to discover how the drinking gourd is different from all of the other constellations being found. In between each of the six locations, while the "seasons are changing," the whole class will be singing different verses of the *Drinking Gourd Song*.

For the Planetarium Teacher

(assume six cooperative groups of four students each)

1. Set heading to North in front of audience, latitude 30 degrees North, Sidereal Time around 10 hours. This is the setup for Position 1. One student finds Orion Setting, another finds the drinking gourd, a third finds the North Star, the fourth announces the altitude of the North Star by simply reading it from the meridian.

2. Run daily motion slowly while singing drinking gourd song, to sidereal time of about 12 hours. While daily motion is on, gradually "inch" northward in latitude to about 32 or 33 degrees. Now you are in Position 2. One member of the group finds the "Goat Star" (Capella). Then with the help of the planetarium teacher, the figure of Auriga is pointed out. The other three group members find the drinking gourd, the north star, and announce the latitude.

3. Run daily motion to about 14.5 hours or until Altair is visible above the eastern horizon. Again, "inch" latitude northward to about 35 or 36 degrees. This is Position 3. Group finds summer triangle rising, the drinking gourd, the north star, and measures altitude.

4. Run daily motion again only to about 15.5 hours, raise latitude to about 38 or 39. This is Position 4. Group finds Cassiopeia rising, the drinking gourd, the north star, and measures altitude.

5. Run daily motion again all the way to about 22 hours while increasing latitude to about 42 degrees or so. This is Position 5. Group finds the Northern Crown (Corona Borealis) right above Arcturus in the western sky, the drinking gourd, the north star, and measures altitude.

6. Final position - Daily Motion to about 1 hour or so while increasing latitude to greater than 43 degrees. This is Position 6. Group finds Taurus rising, drinking gourd, north star, and measures altitude. (about 44 degrees)

The drinking gourd song is sung in its entirety both in the beginning of the program and again at the end. Individual verses are sung between positions 1, 2, 3, 4, 5, and 6. We used WordPerfect Presentations for DOS to make a "Slide Show" of the lyrics for each verse. In this way, the students could read the words to the song while participating. We used yellow, bold lettering on a black background. Then we took 35mm slides for use in the planetarium right off the computer screen. They worked just fine. The slides didn't even need to be masked.

Closure: The planetarium teacher will review with the class why the drinking gourd is a special constellation (because it can be seen in each season and can be used to locate the north star). The class will have one more opportunity to locate the drinking gourd and the north star. Just before dismissal, the class will sing the drinking gourd song again.

Post Planetarium Activity: The teacher will guide the class in the post-visit activity. The students will use their newly gained knowledge by completing a map and a chart resolving how these historical events might have occurred.

(Please see *Drinking Gourd* on page 48)
FOLLOW THE DRINKING GOurd

Constellation Clues | The Drinking Gourd

<table>
<thead>
<tr>
<th>April</th>
<th>Orion Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1

May

“Goatman” Setting

2

June

Summer Triangle Rising

3

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Planetarian
Constellation Clues

July
Queen Cassiopeia Rising

Northern Crown
Arcturus
Aug.-Sept.

October
Taurus the Bull Rising

The Drinking Gourd

N
W
E
N

Computer drawing by Rod Martin, Washington County, Maryland, Planetarium, 1996
Based on the Southampton Planetarium worksheets and lessons by Stu Chapman
PLANETARIUM POST-VISIT

FOLLOW THE DRINKING GOURD
THE DRINKING GOURD

POST-VISIT LATITUDE CHART

<table>
<thead>
<tr>
<th>POSITION</th>
<th>RIVER</th>
<th>LATITUDE</th>
<th>STATE OR COUNTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TOMBIGBEE RIVER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TOMBIGBEE RIVER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TENNESSEE RIVER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>OHIO RIVER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>OHIO RIVER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>LAKE ERIE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Write in the six latitudes from your planetarium worksheet onto your map to freedom chart.

2. **COLOR** the rivers blue. **TRACE** the states along the dotted lines with a pencil. **LABEL** the names of the states. **DO NOT COLOR THE STATES**!

3. Using the latitude and the name of the river from the above chart, mark positions 1 - 6 on your map of the United States with an "X" at each position.

4. Use your red crayon to connect the "X"es with a line. This is the route of the *Underground Railroad*!

5. Using your U.S. map, find the "X" for position 1. Write the name of the state or country the "X" is in on the chart above. Do the same for positions 2 - 6. This will complete the above chart.

COMETS ARE COMING! THE NEW SKY SHOW.

It's over 1.5 million miles long.

It travels at over 90,000 miles per hour.

And very soon, comet Hale-Bopp will be coming right at you.

Comets Are Coming! is a smash hit at Chicago's Adler Planetarium. And in July, this incredible show can be headed right at your planetarium for just $795. Written by David Levy, the 30-minute show features an in-depth look at comets, interviews with Hyakutake, Hale, Bopp, and others, over 240 slides, a digitally mastered soundtrack, an annotated script and production notes, and a spectacular SL9 Jupiter impact sequence. Marketing materials are also available for a separate fee.

For more information or a demonstration tape about Comets Are Coming!, contact Larry Ciupik at 312.322.0315.
People on the Move:

Garry F. Beckstrom (formerly of Longway Planetarium in Flint, Michigan) has been named the new Show Manager at the Delta College Planetarium in Bay City, Michigan. Garry should have his first show up and running in this new Digistar facility by the time you read this.

Carrie Meyers (formerly of Andrus Planetarium in Yonkers, New York) has replaced Garry at Longway Planetarium.

Jose Oliveras (formerly of the Wichita Omnipshere in Kansas) is the new Director of Astronomy at the Chabot Observatory and Science Center in Oakland, California. The center will open in 1999 with a Zeiss VIII for their new 70 foot dome.

David Falk (now at Los Angeles Valley College in Van Nuys, California) has been appointed Assistant Planetarium Director and full-time astronomy instructor after twenty years of part-time association with the facility. David says that friends can write him at LA Valley College, 5800 Fulton Ave., Van Nuys, CA 91401. Sounds like they will keep him busy!

Mary Schindewolf (formerly of Copernicus Planetarium at Sylvania, Ohio) is the new Planetarium Supervisor at Waubonsee Planetarium, Aurora, Illinois. She replaces Jeffrey Hunt, who was promoted to direct the district’s newly created department of instructional technology.

Cheryl Bauer (Einstein Planetarium, Washington DC) is the Acting Director since James Sharp has retired.

Mark Petersen (Loch Ness) will be following his wife Carolyn from Colorado to someplace in New England.

Richard McColman (Morehead Planetarium, Chapel Hill, North Carolina) has moved from the position of Technician to Morehead’s new Education Coordinator.

Did You Know ...

John O. Williams (University of Arkansas at Little Rock) is doing much better. He was unable to attend the Quadruple Conjunction conference in El Paso, but only because he and his wife were renewing their vows that weekend at McDonald Observatory! John was also the recipient of SWAP’s 1996 H. Rich Calvird Award.

Interesting nicknames are one of the results when so many interesting personalities get together for conferences. Johan Gijzenbergs (Europa-Planetarium, Belgium) was reportedly nicknamed “Sati-Yama” which means “Happy Mountain” in Japanese.

Martin George (Launceston Planetarium, Tasmania Australia) had an interesting perspective on the IPS conference in Japan—he wrote “Everything is upside down up here — the lovely crescent Moon we saw last night is the wrong way up, and the stars travel in the wrong direction.” He also noted that Japan is a lovely country with friendly people and that he’d be back.

Thomas Kraupe (EuroPlanet, Germany) was shown in several of Jim Manning’s (Taylor Planetarium, Bozeman Montana) with new friends at the IPS conference in Japan. In each photo, Thomas was with a beautiful young ladies from Japan—a different woman every time! What can you say—he’s a friendly guy.

Laundry can always be a problem when traveling. Ask Phil Groce (Helping Planetariums Succeed, Macon Georgia) about his laundry in Japan.

John & BB Meader (Northern Stars Planetarium, Fairfield Maine) just bought two new starlabs for their institution. The first is a new 16 foot Starlab, as their last one wore out after approximately 130-140 thousand students. The second dome they purchased is Learning Technologies new “SuperDome,” a 22 foot diameter portable which can hold up to 60 children easily!

Laser Fantasy International has brought Chris Seale (LFI, Portland Oregon) on board as the new Theater Operations Assistant Manager. He certainly has made Mike Lutz’s (LFI) life much easier!

In the spirit of International cooperation, Rob Landis (Space Telescope Science Institute, Baltimore) sent some of the Hubble materials to Zina Sitkova (Planetarium, Nizhny Novgorod, Russia) to use with her copy of “Through the Eyes of Hubble,” which she translated into Russian herself.

Don Garland (Noble Planetarium in Ft. Worth Texas) was the guest on 1080am radio when Donna Pierce (Highland Park Planetarium, Dallas Texas) called in and they both told listeners about the lunar eclipse in September, Saturn being near, Comet Hale-Bopp, etc. Donna says it was fun!

The Charles Hayden Planetarium in Boston Massachusetts is being torn down—but do not despair; it will be replaced with a new facility with an even more impressive architectural facade.

The Faulkner Planetarium is up and running again, according to Rick Greenawald (Twin Falls, Idaho). It was closed to repair the ceiling, which was damaged by moisture.

Again, if anyone has any information/news/stories or even jokes worth telling, please don’t be shy! (It’s hard to imagine anyone in our profession being shy, but it happens.) Write, call, or e-mail me and let me know—people out there want to hear about it!
SPACE CREATORS

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The Australian Outback,
The Space Shuttle in Orbit and
A Goto GSS-Helios Planetarium Theater.....
What do all these places have in common?
A spectacular view of a crisp, clear star field!

The GSS-Helios (GSX) features 25,000 stars reproducing a sky seen only from space. Digital shutters mean panoramas without stray stars twinkling through the image. Computer-assisted functions give manual mode the ease of auto mode without replacing the lecturer. The list of special GOTO features goes on and on. Contact your nearest representative and find out what your planetarium could be like.

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Email: Lucy@goto.co.jp
I find the “issue” intriguing, since it is not an issue at all here at the Carter Observatory, which (currently) boasts New Zealand’s only international-standard professional planetarium. The main point, I suppose, is that the most senior administrator, myself (as Executive Director), also happens to be an astronaut.

Since 1992 the Observatory (which is the gazetted National Observatory of New Zealand) had undergone a major restructuring after acquiring an aging Zeiss planetarium projector. Our first new planetarium program was launched on Boxing Day, 1993, and since then we have generated three further shows (with another one scheduled for launch at the end of 1996).

All new planetarium programs and audio-visual shows are planned and produced by a Project Team, which is Chaired by our Public Programs Officer. I am also a member of the Team (though I do not get to attend all meetings).

If we have a problem (or a “challenge”, as we prefer to view it), then this is how to fund the production and marketing of each new planetarium program, given that our budget only allows us to operate in “survival mode”.

Our solution is to seek sponsorship, and to rely wherever possible on the skills of our own full-time and part-time staff and their friends. For example, our Senior Education Officer is a part-time professional photographer, so he does all the slide photography for each program. Our Public Programs Officer is also a skilled artist, so he is able to generate some of the images we require on the Observatory’s computers. An amateur astronomer who has completed one of our evening training courses is a composer (and computer programmer) and he composes original music for each new program. The brother of one of our Weekend Assistants has a band and all the necessary sound studio equipment, and he lays down the tape with the music, background sound effects and the commentary. Our Senior Education Officer and the wife of the Public Programs Officer, provide the voice-overs for the commentary. So, as you can see, it is a team — almost a family affair.

My job, apart from monitoring progress, is to raise any necessary funds, plan the official launch, and develop and implement a promotional strategy for each new planetarium program (and audio-visual show). Now that we have a smoothly-operating production system, we aim to produce two new planetarium programs and three new audio-visual shows each year.

Because these new productions are included in the Observatory’s Annual Plan, which is developed collectively by all staff, everyone knows what is planned, and consequently there is no friction between the Project Team and the administration staff. Having a small, close-knit staff certainly helps, and in one way or another the administration staff get actively involved in the Observatory’s public astronomy and education programs, in any case.

As you might imagine, the morale problem is not an issue at the Carter Observatory. To the contrary, we receive excellent reports on our planetarium programs from visitors (including those used to productions seen in the world’s major overseas planetariums), and this is very satisfying — especially given our limited resources. We work well as a team, and are proud of our overall public astronomy programs.

For further details of these, and our innovative education programs, readers can consult our WWW Home Page: http://www.vuw.ac.nz/~bankst/carter.html

Dr Wayne Orchiston, Executive Director, Carter Observatory
PO Box 2909,
Wellington, New Zealand.
Wayne.Orchiston@vuw.ac.nz

In my mind, this question hits the nail right on the head. So many of the problems faced by planetarians stem from the lack of understanding about what planetaria are and what they do. (Last December, my father, after having his daughter work for a decade in planetaria, said: “I still have no idea what he hell a planetarium is!”) Even the patrons who repeatedly visit (and enjoy) our programs have little idea what it takes to operate a planetarium.

How do we overcome this? I’ll admit it’s easier said than done, but I have a few suggestions which I have either seen myself or heard from others facing the same problem.

Beware the “stand alone” operation. Examine your administration. What are the goals of your institution, as perceived by your administration? In what ways can you support these goals? Offer to assist in the ways you feel are appropriate. Don’t wait to be asked.

Write a mission statement for your planetarium (or revise your current one). I know, many times it goes into a filing cabinet and no one pays attention to it. But the process of writing the statement can itself be a useful tool. Invite members of your administration to participate in the process. Also, invite members of your community (teachers, frequent patrons, etc.) who feel your work is important. Yes, it’s a lot of work to coordinate, but in the process you can discuss the nature of your operation. Your administrators can get some insight into your work, see
how important it is to the community, and walk away knowing they have contributed. And you may carry away some important information about both groups that you did not have before.

Get to know the people involved. Try to interface as much as possible. When your administration does something right, let them know! Don't always be associated with a problem or a complaint.

Of course, what is most appropriate differs from facility to facility. I'd also be interested in hearing about ways we can help each other with this problem. Certainly sharing our experiences is the first step!

Prue Campbell, Public Outreach Office Space Telescope Science Institute Baltimore, Maryland USA

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I am currently involved in three new planetarium projects. One will know about its funding in November; the others are a way off yet. Each project is different, but they all have one thing in common: they all hire accountants and leisure consultants to produce the business plans and forecasts. Both these groups of professionals have very little knowledge about planetaria; indeed, they assume that nothing has changed since their visit to a live lecture at the night sky x number of years ago. While these comments are based on new projects, they could be equally applied to any other situation involving uninformed professionals.

I feel that the first thing a planetarian must realise is that these professionals don't know what you are talking about. You are using a name – planetarium – which means different things to different people. You therefore need to look upon dealing with these professionals as you would a group of students who have no idea about the universe and a planetarium. Indeed, most of them will not be interested at all in astronomy. As someone once said, too often administrators know the cost of everything and the value of nothing.

If you have a board of directors, when did they last see a show? When did you last invite them in to see how you put together a show, or have them sit in on school shows and talk to the students afterwards? If you are doing a good job, then they will be so pleased to hear it from the customers. If they are resistant to coming and finding out, explain that you just want them to see what wonderful things are going on, in case they can think of any ways to improve the facility. Everyone is flattered to be asked for their opinion.

For a new project or a refurbishment, the best thing that you can do is to take your 'students' to another facility that is similar in as many ways as possible to the one that you are proposing. Show them how it all works, what it takes to put together a show, what audiences think of shows. Have them meet other planetarians and ask questions. That way when you talk about things that you'd like to do and what it will cost, they know what you are talking about.

In the UK, there aren't many facilities to start with, so finding a similar one proved too tough a challenge. The alternative was to try and get them to find out about as many of the facilities we do have as they could. They soon started asking questions about what different bits of equipment do, and why some planetaria do better than others. This gave me the opportunity to show them new concepts and ideas, and got them curious about seeing and learning for themselves.

Another thing I have discovered is that enthusiasm is contagious. If you are always up about your planetarium and promoting it actively to others, not moaning about lack of resources, but praising ingenuity and laughing about how you manage to perform miracles, you will achieve several things. Firstly, the money men will actually find it fun to come and talk with you, even if you are going to provide them with a challenge, because they perceive you as a nice person who is doing a good job. Secondly, when you do ask for more resources, their opinion of what your planetarium is and what it does will be an informed one. And lastly, you will feel better about what you do.

Good publicity is always valuable. If you have a very high profile in your community, then use it. Make your administrators feel that it is a good thing to be associated with the planetarium, so that when they are at a party and someone asks them what they do, they will get good responses. Massaging egos may mean that you have to grit your teeth sometimes, and if you find that difficult and you just feel like shouting at them in frustration, go and browse the self-improvement section in your local bookshop. It's a cliché, but How to Win Friends and Influence People is worth reading. It may even help your staff relationships, which will improve morale. These types of books will certainly teach you that there are good and bad ways to ask for things and avoid conflicts.

How does it work in practice? Well, one project has been completely turned around because I managed to get the accountants to start getting excited about some of the new technology and its possibilities. Despite some of their totally idiotic assumptions and questions (Idiotic to me; they just don't know any better!), I only got mad on the inside and not to their faces. They now don't worry so much about comparing the new proposals with what already exists, or asking me for more information, and are even taking an interest in the subject. I had a fax recently of an astronomy related article that one of them had read in a newspaper and found interesting. (No, it wasn't life on Mars). He sent it to me with the note "Will we be able to show pictures like these in the planetarium? Can we do shows about things like this? Is there a projector that can do this? How much does it cost?"

Alexandra Lovell
Science to Go!
Vaughan Flat
Wistow Hall
Kibworth Road
Leicester England LE8 0QF UK

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The contentious tone of this question makes it somewhat difficult to answer. It seems to assume that an adversarial relationship exists between administrators and planetarians as a matter of course. My experience as a school planetarium director for 20 years has been quite the opposite of the situation depicted by this question.

Having worked with several different teams of administrators these 20 years, let me suggest the following:

* Most administrators are, inherently, curious about the planetarium. To most of them, the planetarium is a novelty. It is incumbent on planetarians, then, to take advantage of this initial curiosity and to inform new administrators of the real function of the planetarium. The planetarian needs to provide ongoing, positive feedback about the planetarium and its programming.

* In school settings, it is vital that the planetarium is an integral part of the school district's science curriculum. If not, the planetarian needs to work with administrators and teachers to smoothly integrate the planetarium into the science curriculum. Once this is done, it becomes difficult for administrators to threaten the planetarium with closure.

* At all times, be patient and positive with administrators. If the planetarian has done his or her "homework," the administrators will not be able to come to a point where their intrusions pose a threat to the continued existence of the planetarium.

In short: be patient, be positive, and always be ready to promote the good things that you are doing in the planetarium!

Gary E. Sampson
Wauwatosa West High School Planetarium
11400 West Center Street
Wauwatosa, Wisconsin 53222 USA
For astronomy, a planetarium serves the function of a cathedral, or a high-tech entertainment center, or a laboratory or a classroom. It is a place where people come to consider the wonders of the universe, and the drama of scientific exploration. It is also a great place for a film or light show, a lab experiment, and the first-time experience of recognizing a constellation. For many hard-working planetarians (short-handed persons who do all tasks to keep the place operating, as I did for 15 years), no further justification is needed. The planetarium is a terrific, exciting, wonderful place that is so inspiring that its existence should never be questioned let along justified. That is the reason they became planetarium Directors. (It wasn't the high social status, incredible pay scale, stock options, company cars and executive vacations at resort condos.) However, there is hubris in this point of view. As terrific as the planetarium is, and as wonderful as its programs are, the customer needs to be first, and that includes the "astronomy- and planetarium-ignorant administrators."

Administrators pay the bills. They represent the funder (often the taxpayer) and distribute funds to support the mission or vision of their institutions. If the planetarium is not a part of the institutional mission, of course there will be walls to be scaled and planetarium staff will feel neglected and abused. How can this be avoided? First, clear communication with all administrators is key. Include them in your short and long-term plans, provide attendance data, do projects which respond to local needs, build partnerships with the local amateur astronomers, etc. Within a school system, this goes beyond the principal, custodial services and purchasing departments. If the superintendent is proud of your program, and the school board is well informed of your successes, lots of walls will fall down. If the superintendent does not know you exist, or only sees your name/facility as a line-item in the budget, then the walls go back up because the superintendent cannot answer the question, "Why is a new star lamp or support for a planetarium technician as important as funding the computer lab, the basketball team, or the library?" You can bet that the computer teacher, the basketball coach, and the librarian have already made their case and have constituents at the board meeting.

Secondly, a well-planned program of school and community events which meets local needs is important. You may love the idea of a program on dark matter for your new school show — think of how dark you can make a planetarium. However, it may be more useful for your community to present a program on the solar system which is taught in all of the fourth-grade classes in alignment with the new National Science Standards and the state curriculum outline. Yes, you have been there and done that, but it is the program desired by your customer.

Thirdly, discover what motivates the administrator(s) to support programs. Is community visibility? New students at your community college? More visitors at your museum? Alignment with the district science/math curriculum? Programs for underserved groups? Good breakfast talks at the animals clubs (Elks, Moose, etc.) on short notice? To insure ongoing support, the planetarium needs the same skills as a good salesperson: close the sale on what motivates the buyer. In the case of administrators, it is often good information, relevance to the community, and responsiveness to the overall mission of the institution.

And finally, develop and use an advisory board of community members including the administrator, teachers, politicians, youth leaders, laser light-show faithfuls, and your local banker and newspaper editor. They are your best advocates, and can help generate support for the planetarium as a community facility. And yes, that all requires the expenditure of valuable time out from under the dome. But without that time well spent, the planetarium may not be supported.

A final comment. Research scientists also feel that their time is very valuable, and resent the time required to write proposals, make oral presentations for selection boards, account for funds, write up reports, and otherwise justify their existence. If you doubt this, ask a research scientist at a local university or research laboratory. Most spend 20-40% of their time on such administrative tasks. They would prefer to be in their laboratories and observatories, or at their computers crunching data and writing papers for publication. However, in the real world, the research scientist (and the planetarian) must obtain funds and administrative support for their work, and the time spent to do that IS valuable.

Edna DeVore
SETI Institute
Mountain View, California, USA

With fiscal constraints being increasingly put on educational programs, a planetarium looks like something that can easily be cut to save money. That is exactly what happened in Howard County, Maryland, a rich suburban area halfway between Baltimore and Washington, D.C. The two original planetariums were installed in middle schools in 1969, and the teacher who used them left two years later. They became rooms for movies until 1977, when a grant brought in a consultant to suggest ways to utilize them for their original purpose. A full-time person was hired a year later who shared their time between the two facilities. With a budget crunch in the early 1990's the position was cut in 1992, and one of the two planetariums was demolished in 1994 when one of the middle schools was renovated.

The last planetarium has been spared from the wreckers' ball for one year only, through the action of a planetarium committee formed of teachers and concerned citizens in the County. Letters to the editor were submitted to local newspapers, and finally an editorial was written by a former student who recalled how the planetarium opened up his eyes to the wonders of astronomy. As a result, the local school board gave the science office a one-year reprieve to come up with a plan to successfully utilize the planetarium, with little or no cost to the school system. That is the challenge the members of the planetarium committee and concerned educators now face. I would like to challenge you to give me your suggestions for low-cost ways to utilize the planetarium, and integrate it as an integral part of our community's educational resources. We're dealing with a school resources administrator who thinks that the planetarium no longer is useful, since it was built for a 1969 sky!

Rus Poch, Professor of Physical Science
Howard Community College
Maryland, USA
rpoch@ccm.howardcc.edu

Much food for thought there, then. I think the message that comes across is that planetarians should treat administrators as customers who need to be embraced in the joy of the planetarium experience. They're as likely as everybody else to have an interest in the night sky, so make them active participants in the learning process, rather than (as some can be) bemused onlookers from the sidelines.

Here is the subject for the next Forum column:

All things being equal, over the next five years how can the astronomy resources on the Internet best be developed to maximise their usefulness for planetarians?

Until next time, I'd like to wish everybody a very happy Christmas and prosperous 1997. Comet Hale-Bopp is coming, so that's already one good thing about next year!
Most Frequently Asked Questions:

QUESTION: What is the most frequently asked question about 'STAR HUSTLER'?
ANSWER: That's easy. Everybody asks about our theme song which is the classic 'Arabesque #1' by Claude Debussy performed by Tomita on the still available "Snowflakes Are Dancing" album (RCA).

QUESTION: At what times and days of the week can I see 'STAR HUSTLER'?
ANSWER: Most TV stations air 'STAR HUSTLER' just before nightly sign-off. However, due to 'STAR HUSTLER's' enormous popularity a number of stations find the show's 5-minute format can fit anywhere during the broadcast day and air the show more frequently. Local TV listings seldom include 5-minute shows, so it's best to call the station for the broadcast schedule.

QUESTION: If I can't find 'STAR HUSTLER' on my hometown PBS station, how can I see it where I live?
ANSWER: 'STAR HUSTLER' is provided free of charge by WPBT, Miami to all PBS stations. If you can't find it, write or call your local PBS station and ask if they will air it and remind them that it is available free of charge.

QUESTION: Is it necessary to get special permission to use 'STAR HUSTLER' for astronomy club meetings, teaching in the classroom, science museum or planetarium use?
ANSWER: No. In fact, many astronomy clubs, teachers, science museums and planetariums have been taping 'STAR HUSTLER' off the air and using it regularly as a way to reach their public.

QUESTION: Is there any way I can get 'STAR HUSTLER' other than my local PBS station?
ANSWER: Yes. A month's worth of 'STAR HUSTLER' episodes are fed monthly to a satellite from which all PBS stations take it for their local programming. Anyone with a satellite dish is welcome to the satellite feed. Again, no permission is required. For satellite feed dates and times call Monday through Friday (Eastern time) 305-854-4242. Ask for Mrs. Harper or Mr. Dishong.

QUESTION: I am a teacher planning my curriculum and would like several 'STAR HUSTLER' episodes in advance, but I do not have access to a satellite dish. Is there any other way I can obtain 'STAR HUSTLER'?
ANSWER: Any teacher anywhere around the world can obtain 'STAR HUSTLER' episodes in advance through their NASA C.O.R.E. Teachers' Resource Center. For details write:NASA C.O.R.E.; Lorain County Joint Vocational School; 15181 Route 58 South; Oberlin, OH. 44074.

QUESTION: Why does 'STAR HUSTLER' always say "Keep Looking Up!" at the end of each show?
ANSWER: Have you ever tried star gazing looking down?

---

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Book Reviews

April S. Whitt
Fernbank Science Center
156 Heaton Park Drive NE
Atlanta, GA 30307 USA
april.whitt@fernbank.edu

Many thanks to our reviewers for this issue: Edward Albin, Julie Christian, Deb Fuller, Robert Hicks, Francine Jackson, Carrie Meyers, John Mosley, Gloria Rall, Karl von Ahnen, and Richard Williamson.


Reviewed by Deb Fuller, Alexandria, Virginia, USA.

Super Paper Airplanes is a delightful little book combining the history of flight with some very intricate paper airplane building. The 96 full-color illustrations are nicely done and fun just to look at. The short paragraphs of technical and historical information that accompany each model airplane instruction are also interesting to read.

The book starts out with a short one-page history of flight. The next two pages are spent explaining the three simple folds used with all the planes and other construction techniques such as measuring, cutting and gluing. The supplies needed are fairly easy to obtain: 20 to 24 pound bond copier paper, scissors and glue (a glue stick is recommended). The diagrams are very clear and easy to follow. I also like the safety note about not flying planes at people or near a street.

Each paper airplane is a piece of flight history as well as a short lesson in aerodynamics. The first two are models of early gliders used in the pre-flight era while the next 16 planes go through the entire history of flight from pre-WWI planes to modern jets, ending with concept planes like the space plane.

In addition to construction directions, each plane comes with historical as well as aerodynamic information, explaining how planes fly and the problems solved and created with each plane design. This makes the book enjoyable to read and valuable as a reference book on flight.

Finally, a short reading list and an index finishes the book. I would have liked to have seen a longer reading list at the end, especially expanding on aerodynamics and the history of flight. Super Paper Airplanes is written on about a 5th grade reading level and the explanations are clear and easy to understand.

I enjoyed the book even though I'm not an avid model builder or an airplane enthusiast. Aerospace engineer Dale thought it was "kinda nifty if you have time to get out all the supplies." We both agreed that it is not for the impatient child and recommend it for ages 10 and up. Younger children could probably handle the construction with help from a grown-up or older child.

This book also has many supplemental uses in education. For the middle school grades (4-8), it would make a wonderful extra project to accompany a unit on flight. For high schoolers studying aerodynamics, you could assign one plane design to lab partners or small groups and have the class compare designs, speed, aerobatic potential, etc. or hold an airplane Olympics. They would even make nice decorations for an exhibit on flight. The possibilities are endless.


Reviewed by Julie A. Christian, Hastings College, Flagstaff, AZ, USA.

John S. Dickey, Jr's book, On the Rocks: Earth Science for Everyone was intended to be "read by a general audience" (p. xi). I feel that most "general audience" members could not comprehend it. The scientific jargon used throughout this book makes this book difficult to read and to comprehend by a general audience, even though there are vague definitions of many of the terms. Perhaps by changing the audience of this book from general to a beginning science audience the material discussed would be more comprehensible. This book would make an excellent review for those studying geology and for those whom have studied geology and the other sciences in the past.

While many of the chapters can be very complicated for general readers, there were numerous well written chapters to captivate any audience. Chapter 1, "Gathering Stardust," was one of those chapters. I found that Dickey explained Olber's Paradox really well when he concluded his idea with a quote from Chet Raymo: "Stars glitter on a black cloth of night because the universe had a beginning."

Chapter 2, "Atoms, Crystals, and Rocks," was a chapter that would not have been easily understood by a person unfamiliar with science. Without previous experience in chemistry I would have been lost. This chapter was filled with many chemistry concepts that can be difficult for a student in a chemistry class to comprehend, let alone the non-scientist, especially in the brief amount of time used to cover these concepts.

Dickey often approached many of the concepts covered in this book from a different angle than most scientific publications. Chapter 5, "Older than the Hills," was probably one of the best written chapters in the book. Throughout this chapter he encouraged the reader to question things that are around him/her. The way in which the questions were posed reminded me somewhat of the curiosity and enthusiasm of a child.

I feel that this book is a well-written scientific publication that could be enjoyed by many readers; however, I also feel that this book was not written on the level for which it was intended. As a college student I find this book to be a great review of many of the concepts that have been covered in my classes. This book tried to cover a lot of information in very few pages and was successful in doing so.

I encourage anyone studying geology or anyone wondering how it all fits together to read On the Rocks: Earth Science for Everyone.
some of the more popular teaching tools (arc to Arcturus, speed to Spica, point to Polaris, etc.).

From the stars, Melton continues with naked-eye objects, including the Moon, planets, and meteors. Activities are included for each topic, as well as the standard warning about viewing a solar eclipse. She gives one of the better explanations about observing an eclipse under a shady tree, and her hints on meteor watching are worth the read.

From naked-eye observations, Melton talks about using a "little help," that is, using binoculars and telescopes. The binocular section is pretty good, but she tries to put too much into the telescope chapter, including naming every accessory ever invented except an eyepatch. A little too much, too fast.

For a beginner, the book isn't bad. Melton obviously likes to be outside at night, and it shows in her enthusiastic writing. However, her choice of star charts, from The Sky software with its numbering system for deep sky objects, can be confusing for a new observer. And, of course, to be picky, the Big and Little Dippers are listed as "constellations," Arcturus can be assumed to be visible all year, and Mars is said to be "...seldom bright in our skies," a surprise to all who have seen it shine brighter than Jupiter. Also, she needs to explain some concepts a little more; for example, "Constellations are generally made up of the brightest stars."

Generally though, the book is a good introduction to the night sky. Melton's enjoyment of the night sky is apparent, and her book is a good choice for someone wanting to venture out for the first time.

Reviewed by Gloria D. Rall, New Jersey State Museum Planetarium, Trenton, New Jersey.

This book is the fifth in a series of Practical Astronomy Handbooks. It is a book for the serious, practiced observer who knows the sky well and is very adept with a telescope. The approach is to a reader knowledgeable enough to be ready for advanced observing who hopes to make original discoveries.

The book is extremely well organized. The writing is clear and lucid. It is done in "textbook" style with no diversions or asides. The level of writing assumes the reader is well acquainted with the terminology of astronomy and well read in the subject.

Just as the title implies, the focus is upon observing comets, asteroids, meteors, and the zodiacal light. The book opens with explanations of all the factors that can affect viewing. Serious record keeping and submission of new findings to the correct authorities are covered. The importance of accurate time is stressed.

Each object is covered in its own chapter, and all chapters are organized exactly alike. A brief historical background opens the chapters. The nature and origin of each object is discussed. When, how, and where to look are next introduced. Drawing, photography, and other means of preserving observations are covered thoroughly in great technical detail.

The book concludes with such advanced techniques as astrometry, spectroscopy, and photometric photometry techniques. Numerous formulae are given, and it is assumed the reader knows geometry and trigonometry.

Useful appendices include a glossary, report forms, working list of meteor streams, simple reduction programs, addresses of relevant organizations and publication, references and a bibliography.


Reviewed by: Robert D. Hicks, Richmond, Virginia.

Unlikely to be familiar to most readers of the Planetarian, Euclid's Phaenomena is a comparatively little known early treatise on the application of geometry to some fundamental astronomical problems. Unlike Euclid's other works, milestones in western intellectual history, Phaenomena has been beyond reach of many scholars in the history of science owing to lack of a recent translation from Greek. The authors have remedied this problem by translating it for the Institute for Research in Classical Philosophy and Science (of which Euclid's Phaenomena is volume four in a series under the Institute's aegis). Scholars have been aware of this fourth century BC work and its many translations through many cultures, its importance seen as illuminating the definition and solution of several astronomical problems before the more familiar Hipparchus, Apollonius, and Ptolemy.

The authors cite the importance of Phaenomena "as an introduction to the geometry of circular arcs on the sphere and to the problem of rising times of ecliptic arcs" (ix). Specifically, Phaenomena consists of several propositions and proofs outlining geometrical solutions to the determination of risings and settings of stars and significant great circles or arcs on the celestial sphere. In fact, about half of the theorems presented in the Phaenomena concern calculating the length of daylight at a given place, apparently the earliest extant treatise on this problem. The authors recount the antecedents to Euclid's text, some dating to the Egyptians of the twelfth century BC. Later, the Babylonians recognized that the length of daylight was related to the rising and setting times of ecliptic circles. This insight led to methods used to calculate the length of daylight which preceded spherical trigonometry. In fact, the authors believe that Phaenomena was intended as an exposition of the assumptions governing earlier views.

The Phaenomena sets forth the assumptions underlying the subsequent propositions. The cosmos is stated to be a sphere, the stars themselves located on circles (that are part of the sphere) equidistant from the observer. The celestial sphere turns about an axis in a uniform rotation. Further, the earth is taken to be a sphere at the center of the cosmos. Upon these assumptions, the text defines a number of terms (meridian, horizon, equator, ecliptic) before proceeding to the theorems governing stellar risings and settings and the risings and settings of ecliptic arcs.

Although this is a specialist book, the theorems are accessible to anyone who has taken high-school geometry, although the work's role within the history of mathematics and astronomy will be understood only perhaps to a scholarly audience. A well-written, clear introduction places the work in historical context, discusses questions of authorship and past translations of Phaenomena, and the book offers an excellent glossary of English-language terms, a glossary of technical terms in Greek, a comprehensive bibliography, name index, and two subject indices (in Greek and in English).

This book may interest planetarium educators because of its logical arguments about apparent phenomena used in timekeeping. In fact, Euclid had an educational purpose in writing the text, although the authors point out that Phaenomena is not a beginner's guide. A later edition of the work was included in the fourth-century AD collection known as the Little Astronomy, an instructional text, although Phaenomena was edited
to be more accessible to novices. Educators who teach methods and instruments of medieval astronomy (particularly the planispheric astrolabe) will find the Phaenomena an interesting complement. Certainly, ancient scholars familiar with the astrolabe would have been able to verify mechanically the proofs adduced geometrically in the text.

William's criticism of the book is the obvious, for new images and information continue to pour in seemingly without end. There appears no way to update such a book so that it contains the most current information. But such is the expectation of the Hubble Space Telescope and the aspiration of those who continue to squeeze more of nature's secrets from the universe. Perhaps a volume 2 and later a volume 3 would be in order. When these volumes are written, I hope that Daniel Fischer and Hilmar Duerbeck will undertake the task.


Reviewed by Karl von Ahnen, Minolta Planetarium, De Anza College, Cupertino, California, USA

It's always nice to see a good astronomy book for kids. This one is a lot of fun and has a lot of information (a lot more than I was expecting). It's a great bedtime book or a good book to have your son our daughter read to you just before you both go out to look at the stars. I had my 9 year old son read it to me, and he gives it a definite thumbs up.

This book has a question and answer format. A little boy asks questions starting with "Where can I find a Big Dipper?" The questions and answers continue, leading to a wide variety of information: some history, mythology, astrology, star hopping, celestial motions, and more. It even sneaks in using a red flashlight at night. If this was all there was to the book it would be informative but a bit dry. The illustrations however weave a wonderful background story to follow the dialogue.

The adventure starts with the first question. Out of the sky arrives an astronaut in her three seater rocket, to whisk the boy and his dog off to learn about constellations and much more.

The cartoon characters and scenery are fun and whimsical. The illustrations often include actual sky photos, which adds a wonderful effect (what a great ideal). My son noticed and commented on the real star photo backgrounds right away. The characters have lots of personality. I especially liked the family dog.

One problem I have with many children's astronomy books is the tendency to oversimplify, to give a partly correct answer to avoid making something seem too complicated. I have found that kids can understand a lot more than we give them credit for if it is presented properly. This book suffers from oversimplification in a couple of spots. In one place it is stated that "the Greeks could only see the part of the night sky that is north of the Earth's equator". In another place one character says while looking at the sunset, "I'm sure I saw a constellation setting in just that spot last night." I know what the author was getting at with these statements but they are a bit awkward. I'm sure he was just trying to keep it simple, but these statements don't quite make sense if you stop to think for a minute. All in all though this is just nit picking. The book is overall well written. It even has a one-page glossary at the end.

Sidney Rosen is an astronomy professor at the University of Illinois, and Dean Lindberg animates and directs TV commercials. They have at least a half-dozen children's astronomy books to their credit so far. I'd like to see some of the others. They make a great team.

This book surprised me with its wide array of information, all presented in a way that is fun and that kids will really enjoy. I learned something new myself. Did you know that there were once constellations representing a leech, a slug and an earthworm? The illustrations are wonderful. They take the characters and you on adventures in time and space. In the end it makes you want to go out and look at the stars. What more could you want from an astronomy book?
However, many questions felt contrived, as if the author sat down with a list of topics to cover and made the questions up herself. I suppose I was expecting the book to be as imaginative as the minds who ask us those stumper questions at the end of a solar system show. You probably won't get a feeling of “ah ha!” when you read the linear, rather dry prose answers. But you may get a sense of “hmm” as you discover a new way to explain concepts or see things in a slightly new light.

The kids who will actually read this sparsely illustrated book will get some answers to the basic questions, and maybe even will be fooled into thinking that these were the questions they were going to ask had they thought of them. But the simple question, “What is a Black Hole?” sounds like an adult question to me. A kid question goes more like, “OK, like if a black hole crashed into the earth, like, you know, umm, would it kill us?”

I found a few inconsistencies and typos in the book, but nothing a good edit couldn’t resolve. The formula of the book’s layout is simple: The Question, The Answer, The Simple Explanation, and finally, Some More Details. My favorite eyebrow raiser was 61: Should We Travel To Mars? The Answer: Yes. The Simple Explanation: It is human nature to explore, and of all the other planets in our solar system, Mars has the greatest potential to support human life. I was expecting a philosophical debate with a question like that. Instead, the question should have been, “Let’s Go to Mars, Shall We?”

The few illustrations were mostly clear and simple, but I found the drawing of the dark side of the moon unnecessarily confusing. I liked the example of how sparsely the asteroid belt is populated. By both writing the words of really big numbers and writing all the zeros as well, it really gives you a sense of the bigness of a billion.

To sum, if you can add your own imaginative touches to the explanations and answers, the book will serve as a good resource for common topics of discussion. If you wonder if you should recommend the book to kids, it depends on their learning style. If they can do without pretty pictures and think in a linear, organized way, then this book is for them. I would recommend it to some of those kids I see on the other side of the console.

Reviewed by Edward Albin, Fernbank Science Center, Atlanta, Georgia, USA

This softcover book is a revised version of a somewhat classic text on meteorites first published in German in the year 1934. I found the current edition of the small book a refreshing review of all aspects related to the study of meteoritics. The book is divided into three chapters: a) fall phenomena, b) meteorite classification, and c) the origin of meteorites. An appendix includes information on testing for nickel, a list of worldwide meteorite collections, and a handy formula to determine the exchange value of meteorites.

For those who are researchers in the field, the book offers little new information, but for the novice the text does bridge the gap between the scientific literature and the sparse availability of general books on the subject. I found the section on meteorite classification particularly useful. The breakdown of the various types of stony meteorites was clearly presented. However, the book does fall short when it comes to the relatively new study of lunar and martian meteorites. For instance, only a brief page is given to the exciting SNC meteorites. Other than an upside-down photograph of Arizona’s meteor crater on page 35, there appear to be few errors elsewhere.

For those of us in the planetarium field, this little book provides enough background to assist in the identification of suspect meteorite specimens brought in by members of the public. Overall, I would highly recommend Meteorites as an addition to your planetarium’s or library’s bookshelves.

**Discovering the Cosmos** by R. C. Bless, University Sciences Books, 55D Gate Five Road, Sausalito, CA 94965; 1996. ISBN 0-935702-67-9. $54.00.

Reviewed by John Mosley, Griffith Observatory, Los Angeles.

Weighing in at 1.6 kg and with 700+ pages, this is not a volume to be taken lightly. It’s a rather thorough astronomy textbook intended for use in liberal arts one-semester astronomy courses for non-astronomy majors. Students who read the entire book will likely feel nothing was left unsaid.

The text is essentially non-mathematical and with a good dollop of historical background. A college student should not have trouble following the text. The writing is not overly formal, although the layout is. A typical page is a block of text accompanied by one or more b/w photos or illustrations with captions, but there are no sidebars or other devices to break the text. It is meant to be read in a linear direction. I think students will find it thorough but not especially fun.

The organization follows the modern custom of putting cosmology at the front and concluding with the solar system. A long historical overview appears early on, followed by sections on radiation, telescopes, stars and stellar evolution, galaxies, cosmology. The final 150 pages of text are a modern review of the solar system. Also included are star charts and eight pages in color.

As a college text, it looks challenging for only one semester. I, and many planetarians who do not teach upper-level astronomy will find it useful as a reference. It is encyclopedic in scope, clearly written, and up-to-date. I expect to consult it regularly and am happy to have it on my bookshelf.

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**Letters**

**Sky & Telescope Protests**

I’m always amazed at how misleading some innocent remarks can be. Take Jane Hastings comments about *Sky & Telescope in the September issue of the Planetarian*. She says *Sky & Telescope didn’t feature Comet Hyakutake “until the issue that came out in April.” Then she says: “Maybe they [S&T] were afraid to take the chance” that the comet would fizzle. That’s just plain silly. Since the April issue comes out in late February, we printed our first report — complete with finder charts, orbital elements, and photographs of Hyakutake and his comet — only three weeks after the discovery. Furthermore, the discovery was carried on our telephone news service, Skyline, and on our Web page within days of the find. How much more proactive can you get?

Hastings might have mentioned that the other major U. S. astronomical magazine did not carry a Hyakutake story until its May issue. Even then, it got the story wrong, which it never corrected in print or on its Web site.

If someone wants to criticize, let him or her get the story straight. In truth, such a glaring misrepresentation of fact should have been caught in the editorial process of preparing the Planetarian.

Leif J. Robinson
Editor in Chief
*Sky & Telescope*

Leif Robinson is correct, and I accept the responsibility for not catching these unfair comments. — John Mosley.
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1st Science Centre World Congress - "Science Centers Learning for Tomorrow"

This conference was held in Heureka, Vantaa, Finland. Just under 500 people from 47 countries attended. The biggest shock, of course, was to be at a science conference, not a planetarium conference. It has been a long time since I have discussed the other scientific fields and concerns. It was enlightening to hear from so many developing nations and to hear of the problems they encounter. I feel my problems are quite small by comparison. We experienced diversity yet talked about commonalities throughout this meeting. Lars Broman organized a panel discussion and then a demonstration of Starlab capabilities. The panel participants were Lars and Per Broman, Phil Sadler and myself. We had a wonderful time and learned as well as taught a great deal. I discovered there are 75 Starlab portables in India! These planetariums were built in India and are made of special (more opaque fabric due to the extreme brightness of the sun) and are used as outreach to the very rural parts of India. Sometimes generators are needed and sometimes air conditioners! I met many people from both hemispheres and was pleased that I was able to see some of the people I have shared e-mail with over the years. I found several new locations of portables and people who are planning to buy one. My network just keeps growing!

IPS '96-Japan:

Thanks to our magnificent interpreter the three hour Starlab workshop was a huge success. A printed copy of this workshop will appear in the proceedings. From the perspective of the mobile planetarium community, portables made a big impact at this conference. The Starlab held center stage in the foyer throughout the week. The Japanese in particular were very impressed by its clever construction and quality of the starfield. I was delighted to meet a young man, Takayuki Ohira, who built a mobile planetarium as a hobby. However his projector is extremely complicated and projects more stars than the naked eye can normally see. The dome is very heavy and takes many men to lift it. He was very impressed by Starlab and its simplicity! I am still sorting out all my trips this summer and will not doubt include more in future columns as all the information settles! What a fantastic IPS conference though - quite unforgettable in every way. Our hosts were incredibly hospitable and had thought of our every comfort. They provided an organized, beautiful and exciting conference and view into their culture. The interpreters were amazing, at times translating concurrently as we wore earphones to hear English or Japanese as needed. I look forward to and anticipate some continued stimulating communication with my new Asian friends.

An Adventure for American Planetarians in Italy:

The participant chosen for 1996 was Jeanne Bishop who is, I'm sure you'll agree, highly qualified. We were pleased that she applied and certainly look forward to her report. We are now seeking applicants for September or October 1997. A reminder: 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 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 Tuesday to Sunday. For further information and a copy of the application please write to Susan Reynolds at the address at the top of this column. The deadline for this year's applicants is April 16, 1997.

New Letters and Phone Calls:

Kathleen Hunt (Education Coordinator, Sciencecenter, 601 First Street, Ithaca, NY 14850-3507 USA) wrote for activities and hints to supplement a teacher training course which will make teachers eligible to rent Starlab for use in their schools.

Mr. Faud M. S. Al Jomaa (Kuwait Science Club Planetarium, Al Ardelya-92400, PO Box 722, State of Kuwait) wrote asking for ready-made shows. I am sure all who attended IPS '96 received his card. I make it public here for vendors and planetariums who might like to send some information to Kuwait.

Margaret Maddox (E. Tennessee Discovery Center, PO Box 6204, 516 S. Beaman Street, Knoxville, TN 37914 USA) called to compare notes about Starlab outreach programs with and without a specialist.

Ray Worthy (15 Queensberry Avenue, Härnäpulle, Cleveland, TS26 9NW, UK) writes, "This note is to tell you of a development in the mobile dome business. Last week Peter Bassett took delivery of the 6.2m dome which Josie (Ray's wife) and I made for him. In this act, I think we have crossed a barrier and entered a new territory.

"Up until now, I have been making larger domes which gave more elbow room for a class of children. Indeed in the 5.6m dome which you saw in Italy, my pupils all lie down for the programme. They see the sky better that way. An increase from 5.6m to 6.2m does not seem much, but if you consider what it results in, you will see what I am getting at. In a scout hall in Kent, Peter chalked out a ring of 6.2m, and found he could easily fit forty boys sitting down around the circumference. In my 5.6m dome, if I sat everyone down instead of having them lie down, the capacity is something around 60. Add another forty and we are moving into realms where portable planetaria have never gone. Many costly fixed planetaria cannot cater to numbers such as these.

"In order to reach the screen of the new radius the illumination of his "Cosmodysee" was souped up. I had sent Peter a sample for a screen to experiment with, before we decided on the radius. The stars are surprisingly bright."

Ray sent me two photographs of this set up. He continues, "You can see from the photograph the equipment which Peter now uses. Next to the main projector, which is sited in the center, is a control unit with a computer keyboard. This controls the transparent LCD display "tablet" resting on the platform of the overhead projector. In this sized dome the resulting screen display measures something like ten feet by six feet. On the screen can be seen displayed any video or computer programme desired. The whole planetarium ensemble matches most fixed planetaria and I know of a few which it easily surpasses.

"The programmes are varied but are restricted to astronomy. The entertainment is intrinsic in the display. You would truly love it."

"The horizon is down at 0.5m from the floor. This gives a height of 3.6m. It can fit in
most school halls.

"It was sold only last week and already the grapevine has been working. Another planetarian is asking for a similar sized dome.

"Is this the future?"

Jane Sadler (Learning Technologies, Inc., 40 Cameron Avenue, Somerville, MA 02144). When I heard of Ray's dome I remembered someone telling me that LTI had made a larger dome for someone too. When I called Jane she confirmed the rumor. So here's the scoop ... Jane writes, "Here's the information on the Super Dome (though we haven't definitely decided on the name — Super, Giant, Jumbo ... any suggestions?). It is 22' (6.71m) in diameter, 13.5' (4.12m) in height, and weighs approximately 90 pounds. The room size needed then is 8m x 8m with a 4.2m or 4.3m ceiling height. It has double the floor space of the regular dome, so it can fit approximately 60 people. It will probably come with a dome bag, and customers will use trolleys or small hand-trucks for transport.

Potential market: 1) individuals running their own business will have the ability to accommodate two classes of students at a time, 2) large schools who could use it for bigger or multiple classes, 3) museums could use it instead of a small fixed dome as a semipermanent exhibit, 4) we have also had interest from college level educators, who want a large dome to accommodate large adult class sizes, and/or adult size people!"

John Meader (Northern Stars Planetarium, 4 Osborne Street, Fairfield, ME 04937) tested the prototype of this larger Starlab dome. He reports to Jane Sadler, "We set up the super-dome today for the first time and gave its maiden performance, a program for our son's multi-age grade 3-4 class. We had 43 students and five adults inside, with room to spare. Everyone thought it was pretty cool.

The presentation was our "Volcano" program, where we examine plate tectonics, shield volcanoes vs. strato volcanoes, different types of lava, volcanoes on other planets and moons. Lots of great geology. The dome works great. I need to get used to the new group dynamics, they are quite different than in a sixteen foot (4.9m) dome. In the 4.9m dome I have everyone sit around the edge in a circle, in the 22' (6.71m) dome the kids tend to sit in two groups, one in the west and one in the east. I feel much farther from everyone. We are asking all the schools that schedule the 6.71m dome to allow one hour and fifteen minutes per program (the same presentation in the small dome requires only one hour). This allows for more time for the greater number of students to get in and out, and it takes the bigger groups a bit longer to settle down."

The biggest problem, John stated, is the transportation of the heavier dome and he solves that by using a hand truck. He says the set up time is about the same but tear down time is longer because it takes more time to roll the giant new dome!

Student Creation:

I was teaching at one of the North Syracuse School District's Middle Schools and a very highly motivated class came to me for two lessons in Starlab. Their teacher and I have worked well together over the years and I respect and enjoy her teaching style a great deal. Well, after the class had their first lesson with my new assistant, Barbara Nissen, Mrs. Edminster wrote, "Ladies, we so enjoyed your lecture and the relaxing music. We wrote this poem all together this morning." Needless to say I was very pleased and touched by the time they took to create this poem. I love my job, the direct contact with students and the inspiration it provides!

The Reynolds' Rap
(by Mrs. Edminster's reading/writing students)

Color, distance and size make them so bright,
Burning gases give stars their natural light:
Some of the colors are red and bluish white,
Usually they are seen only at night;
The hottest stars are bluish white
You can see them easily because they're bright;
Observing them all from the ground
Makes them look so small and round,
They look so skinny, they look so small
In reality, they are big and tall;
Satellites carry the telescopes high
To avoid the twinkles we get using our eye;
A constellation is a group of stars,
Some can even be seen from Mars;
Constellations form pictures up in the sky
We follow the Zodiac, my oh my.
The Big Dipper is away very far.
It is made up of seven with two pointer stars;
Orion is hunting in the middle of the night,
He's looking for Draco who is really quite a fright;
Canis Major barks all night,
While Ursa Minor holds the Little Dipper tightly;
As blue as Uranus, as yellow as the sun
Neptune's jumpin' rope and Pluto's havin' fun
Jupiter and Saturn stand in the middle,
And let me tell you, they're not so little;
On a dark night, they shine so bright
They give the night a beautiful light;
They comfort the creatures that roam in fear
In morning light they disappear.

Signing Off:
That's all for now...more later.

IPS'98

IPS'96 has taken place — a most interesting experience for those of us lucky enough to be there. Our Japanese hosts set a high standard of organisation, not least in the large number of willing helpers who were available all day to answer every question which delegates might throw at them. It will be a hard act to follow.

But it's now time to look forward to our next Conference in 1998. The dates are June 28 to July 2; the venue is London, a city of innumerable attractions, apart from the Planetarium! Among the highlights will be the opportunity to have supper in the presence of the Royal Family (in wax), take a boat trip down the Thames to the Greenwich Meridian, Old Royal Observatory and National Maritime Museum, and visit the ancient monuments of Stonehenge and Avebury.

There will be an optional Post-Conference tour from July 3 to 7, which will include a visit to Jodrell Bank Radio Observatory and Science Centre. From there we shall cross the water to Ireland, where we shall visit Armagh Planetarium and Eartharium, the 19th century telescope built by the Earl of Rosse at Birr Castle in Southern Ireland, and the ancient site of Newgrange. The tour will end in the delightful and cosmopolitan city of Dublin, with its museums, bars and "crack" (Irish for a distinctive form of animated conversation). You can fly from Dublin to most international destinations.

We hope that our programme will have something to interest everyone, so put the dates in your diaries now, and begin to save your pennies (or dollars or yen etc.). We shall be updating you via the Planetarian as our plans get more advanced.

For now, though, we give a WARNING! We shall be setting much earlier deadlines for registration than usual. This is because a conference of this size presents some problem peculiar to London, and in order to reserve the facilities and the bedrooms we need, and at the prices we can afford, we have to guarantee confirmation six months in advance. You will therefore be asked to confirm and pay for your registration fee and one night's accommodation by the end of January 1998.
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S-79171 Falun, Sweden
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The Regional Roundup column depends entirely on contributions that I receive from IPS Affiliate Associations all over the world. Please continue to contribute as you have done before. In order to be sure that your text will make it into the column, please send it so I have it at the first day of the Planetarian deadline month, preferably by e-mail. The deadlines for contributions to the January issue is thus 1 January, and for the second issue of 1997 is 1 April.

Thanks to Bart Benjamin, Undine Con-cannon, Mike Murray, Christine Shupla, and Zinaida Sitkova for contributing to the Regional Roundup Column this time. You are welcome back with new reports, and I look forward to reports from other Associations as well. Please remember that a short note is also appreciated!

British Association of Planetar­iums

Technique, Cardiff. Special astronomy events will be run this term, including a program sponsored by Lloyds Bank and an evening devoted to in-service training of teachers. National Astronomy Week is commemorated with a family viewing evening.

Glasgow Planetarium Project. Application for funding from the Millennium Commission is still ongoing, but they remain hopeful. Their three Starlabs have been much in demand this year, even as far as the Islands of Lewis and Harris, with the help of outside funding. John Brown (Astronomer Royal for Scotland) reports that they are learning fast about the practicalities of visits and the wear and tear on domes.

Hartlepool *Stargazer* Planetarium. Ray Worthy seems to be changing from a presenter of shows into a maker of custom-built domes for others. He spends much more time in experiments to make the perfect inflatable dome. His latest effort, made for Peter Bassett (see below), holds up to about a hundred children in one performance. It comes down in 2 or 3 seconds just like the smaller ones.

Jodrell Bank Science Centre & Planetarium has completed a successful year with a total of 139,057 visitors and an 11% increase in revenue, which will facilitate the purchase of special effects for the planetarium and further refurbishment of the exhibition.

Astronomy Roadshow, in Kent now has a 6.20 meter inflatable dome made by Ray Worthy. The larger floor space allows two classes of pupils to enter at one time, which allows Peter Bassett to have slightly shorter working days! He believes this is the largest such system in the world—can anyone verify this? (Answers to Peter Bassett, please, at 167 Shakespeare Road, Gillingham, Kent ME7 5QB, UK)

Liverpool Planetarium. Several changes have taken place; Paul Dearden is now Curator of the Planetarium, while Alan Bowden has become Curator of Earth Sciences. Technology has been upgraded with Electrosonic's Easy + system and a Component Recording Videodisc, acquired with funding from PPARC. (Particle Physics & Astronomy Research Council). The Living Universe is the new public show, and there are two new shows for schools as well.

Caird Planetarium, London. During July and August, the regular program of guest lecturers featured the 150th discovery of planet Neptune. Scout and Guide groups have had special shows, while nearly 3,000 people have seen the public Summer Sky show.

London Planetarium. A new show is launched for National Astronomy Week. By public demand it features the planets, hence its title Planetary Quest. The show is about some alien beings fleeing from a nearby supernova explosion and having to find themselves a new home. It has been a real challenge to produce a show during our very busiest season (3000+ people a day!), but we have been helped by Robin Sip (ex-Omniversum in The Hague, Netherlands), who has produced some of the Digistar graphics. The planetarium's own Chris GutterIDGE has risen magnificently to the challenge of fitting them into the show and creating some more of his own. Popular (and once controversial) writer John Gribbin rounds off the week by telling us How to make a Universe out of Nothing at all.

Mizar Traveling Planetarium. Bob Mizar is the coordinator for the British Astronomy Association BAA Campaign for Dark Skies, but has become a planetarium as well. He has recently installed the Mizar Planetarium within the hallowed walls—and it was a tight fit!—of the Lady Chapel of Christchurch Priory, which recently celebrated its 900th anniversary. He reports that many in the audience were amazed to know that the light from some stars has been traveling for longer than 900 years to reach us. Of course, the problem of light pollution comes into all his presentations. Bob, a teacher of French, is now thinking of taking the Mizar presenta­tion to his City's twin, Valogenes in France, to make a truly cross-curricular as well as cross-channel experience!

James Lockyer Planetarium, Sidmouth.

Great Lakes Planetarium Association

Illinois. The Adler Planetarium in Chicago will be presenting their own production of Comets Are Coming and a new production called Seeing the Invisible Universe. This latter show focuses on astronomy conducted beyond the visible spectrum and the Compton Gamma Ray Observatory. In conjunction with the new show, Adler will also be opening a new exhibit called the Adler-American Space News Center. This exhibit will introduce the public and the media to new discoveries in astronomy and space science as they happen. With each new discovery, the local media will receive videos, photographs and press releases, and the general public will be able to access the information by visiting the exhibit and via the Internet.

The Cernan Earth and Space Center at Triton College in River Grove will present SpaceShip Earth and the children's show Dinosaurs in Space in September and early October, and the C-360 film Genesis: The Story of Earth and the children's show Teddy and the Rickety Rocket thereafter until Thanksgiving. The Cernan Center's Monthly Skywatch series and four different laser light shows will also be presented during this time.

The Illinois State University Planetarium will debut its new program Bear Tales (and Other Grizzly Stories) in September. This program presents stories from ancient Greece and Egypt to modern tales such as Black­erhead the Pirate. The ISU Planetarium continues to host public observing sessions once a month.

The Lakeview Museum Planetarium in Peoria, is currently featuring Welcome to the Universe, the Joe Hopkins Engineering show with spectral information and audience par—
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incitation added. Laser light shows will begin with a Halloween presentation and continue through the solstice season. Saturday mornings during the school year include a rotating schedule of children's shows with a hands-on activities before each one. In cooperation with the local Girl Scout council, these have been coordinated to the requirements for Brownie and Girl Scout badges. The Community Solar System rides drew great response, both for the bicycle ride in July and the motorcycle ride in August.

The William M. Staerkel Planetarium at Parkland College is currently showing Inner Space, a new multi-media production that examines the miraculous workings of the human body, using cinemicrography and fiber optics. This will run until Thanksgiving, when a new version of Rites of the Season will premiere. In addition, Prairie Skies is shown on Fridays and Teddy's Quest on Saturdays. The light show featuring the music of The Doors will change to The Age of Aquarius, the planetarium's 60s show, after a run of their Halloween spectacular. The public was invited to view the total lunar eclipse at the planetarium on September 26th. Jim Kaler will give a talk on pseudoscience on December 6th.

The Olivet Nazarene University Planetarium in Kankakee has hired a new planetarium director, Brock Schroder. Formerly a student operator at Olivet, Brock went on to get his Masters in Education, and has been serving as the Program Coordinator for the Detroit Science Center for the past two years. Congratulations, Brock!

Indiana. Dan Goins of the Martinsville High School Planetarium attended the American Astronomical Society Teacher Resource Agent project in Flagstaff, Arizona this summer. While participating in the project, Dan visited Lowell Observatory and the observatory of Northern Arizona University where he did CCD imaging with a 72-inch telescope. The AASTRA workshop emphasizes a hands-on approach to the sciences using astronomy as the base subject. Dan's work is not over, because in order to complete their course work, participants must conduct two hands-on workshops a year for two years. Dan and a colleague, David Williams (a physical science/earth science teacher from St. Cloud, Minnesota) will be offering a two-hour workshop at the GLPA Conference. The workshop is entitled The Great 3-D Seasonal Constellation Workshop.

Dr. Ronald Kaitchuck and the Ball State University Planetarium conducted a course entitled Instruments and Techniques of Planetarium Operation, a three-hour Graduate Course (Astronomy 582). Ron was assisted by Gregg Williams of the Merrillville Community Planetarium and Mark Reed of the Peter F. Hurst Planetarium in Jackson, Michigan. Indiana GLPA members Peggy Gebhart and Alan Pareis attended the course. Alan found the course "fantastic" and plans on writing an article on his experience for a future issue of the GLPA Newsletter.

Welcome to new GLPA members Richard N. French III and Andy Rossw. Both joined while attending Dr. Kaitchuck's course. Richard is a teacher in the Indianapolis area and Andy is a teacher in Coldwater, Michigan.

Michigan. The Abrams Planetarium in East Lansing is producing an original show production entitled From Stardust to Infinity: A Cosmic Journey, which opens on 27 September. They continue to show Larry, Cat in Space and a live autumn sky show.

The Chaffee Planetarium in Grand Rapids recently hosted the Digistar User's Group. The planetarium will close for three weeks in September to work on the chamber, reopening on October 2nd with Cosmic Perceptions.

The Delta College Planetarium and Science Center has acquired Garry Beckstrom as its Show Manager. He reports that the theater will be completed in September, that the interactive seats are in and that the Digistar will arrive soon. All this is an upgrade from the world's only operating Spitz A-3. Congratulations and best of luck to you, Garry!

The Kalamazoo Public Planetarium is running 17 shows simultaneously each week! Included in this extensive repertoire is The Little Star That Could, Dome Improvements, and Cosmic Catastrophes. Attendance has been great, and plans are being made to produce a program about the Underground Railroad.

The Longway Planetarium in Flint has been breaking attendance records this summer. Their popular evening laser show Symphony of the Stars is continuing, along with their two main shows, Galaxies and Our Place in Space. Director Mike Gardner hopes to fill the Producer/Assistant to the Director position soon. He may be reached at (810) 760-1181.

The McMath Planetarium at the Cranbrook Institute in Bloomfield Hills reports a busy summer as well. They are working on an in-house production called Night of the Planet, which will premiere this fall. They have also been sponsoring telescope viewing for museum visitors and presenting star and laser shows. Their laser show Modern Rock continues through the fall.

Ohio. Two Ohioans, Joe DeRocher and Dale Smith, attended the IPS Conference in Japan and in the most literal sense brought the greetings of their state to the Land of the Rising Sun—the Japanese word for "good morning" is pronounced "ohio". Joe and Dale also enjoyed the pre- and post-conference tours showcasing the best of Japanese culture: temples from the historic past and Minolta and Goto factories from the technological present.

Rick Pirko writes that the familiar face of Warren Young is back prowling the hallways of Ward-Beecher after an extended illness. Welcome back, Warren! Are you getting ready for the GLPA Conference in 2010? (Warren hosts GLPA at intervals of one saros cycle and 2010 is the next cycle after 1972 and 1991.)

Speaking of "Warsens", the Warren Western Reserve School Planetarium is reopening this fall with a new director (Ron Kozel) as well as all-new projection galleries and JHE automation. The Warren Planetarium is located a few miles from Youngstown and had been closed for a decade. Welcome, Ron, and best wishes!

Wisconsin/Minnesota. For September, October and November, the Minneapolis Planetarium is running Amazing Stargazing (Minneapolis Planetarium and Radio Oz), Honey, I Shrunk the Universe (Minneapolis Planetarium), and Through The Eyes Of Hubble (Buhi Planetarium). They will also show The Far Side Of Halloween (Minneapolis Planetarium and Strasenburgh Planetarium) in October.

Dave DeRemer of the Horwitz Planetarium (Waukesha, WI) taught a summer introductory astronomy course at Carroll College of Waukesha. He will be running Loch Ness Productions' The Mars Show for his October public program and Minneapolis Planetarium's Honey, I Shrunk the Universe in November.

The University of Wisconsin-La Crosse Planetarium suffered water damage to its main instrument and auxiliary control system in July. The Spitz A3P may be back in operation in mid-September and new auxiliary controls may be operational by early November. A newly installed eyewash machine in a Biology Department lab directly above the dome room was the source of the water leak. An improperly crimped (at the factory) hose was the cause.

Gary Sampson has presented a paper on A High School Astronomy Course for a Wide Range of Student Abilities at the International Astronomical Union education colloquium at the University College London.

Seeking low-tech special effects. GLPA member Dan Goins is editing a TIPS booklet on inexpensive low tech special effects. Dan is ready to receive your plans for the special effects you have found useful. Please mail your camera-ready plans to Dan Goins, Planetarium Director; Martinsville High School; 1360 E. Gray Street; Martinsville, IN 46151, USA. If you have questions you can
also contact Dan via e-mail at dgoinos@sci-can.net, although Dan cautions not to send your actual drawings and descriptions that way.

**Russian Slide Project Update** The GLPA Russian Slide Project is progressing, though slowly. Unfortunately, the Russian IPS representatives were unable to attend the IPS Conference. We had hoped to deliver the slides to them during the conference, so we are still trying to settle the delivery logistics. Shipping the slides seems out of the question for a number of reasons. Once the delivery logistics are solved, the slides will be duplicated and packaged. If anyone is going to Russia or knows of someone who is going any time this year or even in early 1997, please contact Alan Pareis at +1 219 432 8786 or +1 812 299 2988, or e-mail him at parvanlav@aol.com.

**1996 GLPA Conference.** When you read this, the 32nd annual Great Lakes Planetarium Association (GLPA) Conference has been held at the Minneapolis Planetarium in Minneapolis, Minnesota from October 23-26, 1996. This was the third time that Minneapolis hosted a GLPA conference, the prior two having taken place in 1969 and 1979. The Minneapolis Planetarium was built in 1961 and houses a very unique Spitz Model C projector that hangs suspended by the ceiling. Featured speakers were Alan Hale (of Comet Hale-Bopp fame), astronomer writer Deborah Byrd, Spitz lecturer John Hare, former of the Abrams and Bishop (Bradenton) Planetariums, and astronomer Dr. James Kaler from the University of Illinois.

**Italian Planetaria's Friends Association**

A new planetarium with 5 meter dome has been opened in the Science Center of the VISUS institute of Napoli (Naples). The star projector is a Goto EX-5 model. This planetarium is the second in the city. In fact the small model Goto EX-3 is already available in the Astronomical Observatory of Capodimonte.

The secondary school Giordano Bruno of Turin has opened a small planetarium equipped with a Goto EX-3 projector. The management is assured by the teachers of science.

The University of Genova, DIST Department, has organized a course for the local Starlab operators. The lessons were given by Dr. Cary Snider, chairman of the Astronomical Department of Lawrence Hall of Science, University of California, Berkeley.

Last summer, Prof. Franco Potenza died. He was one of the most active lecturers of the Milan Planetarium. The next national meeting of Italian Planetaria will be dedicated to Prof. Potenza.

The VII Day of the Planetarium will be held on 23 March 1997, organized also in different European countries.

The next course for small planetaria and public observatories will be held in Lumezzane, Brescia on 19-20 April 1997.

**Middle Atlantic Planetarium Society**

MAPS has decided to change the venue of its 1997 Conference to Chadds Ford. The Conference will be hosted by Spitz, Inc., and conference dates have been set for 7-10 May. Spitz facilities will be used for selected paper sessions, shows and presentations, in addition to meeting facilities at the Wilmington Hilton. Registration form and conference material can be obtained from Charles H. Holmes Jr., Spitz, Inc., P.O. Box 198, Route 1, Chadds Ford, PA 19317, USA, fax No. +1 610 459 3830, e-mail spitz@libertynet.org

**Nordic Planetarium Association**

The 13th NPA Meeting, scheduled to take place in Tromso, Norway 19-20 October was moved to Stockholm, where Mariana Back hosted a stand-in meeting at Teknorama, Swedish Museum of Technology. Participants were treated to a live theater play on four historical women scientists by the Teknorama staff. More reports from the meeting will follow in the *Planetarian*, January 1997.

Broman Planetarium reports that two new portable Starlab planetariums have been ordered and will be delivered before the end of the year, one to Franck Pettersen at Tromsålsens Videregående Skole, Norway and one to Ursa Astronomical Association, Helsinki, Finland. These will become the sixth Norwegian and the first Finnish Starlabs. Furthermore, Broman Planetarium main office has moved to Kvarnvedsgatan 11, S-416 80 Göteborg, Sweden, phone +46 3125 6475, fax +46 3125 6477, e-mail (same as before) per.broman@planetarium.se.

If you have access to e-mail and would like to receive (and provide) news on Swedish science centers and planetariums, you are invited to join Alibireo, which began operation last month. The main emphasis is to facilitate informal and free information between planetarians and Science Center people. Languages are Swedish (but at least in the beginning omitting the last three Swedish letters, writing them as aa, ae, and oe instead) and English. Also planetarians from other countries who want to participate is of course welcome to do so. Just send, by e-mail, a statement that you want to subscribe to alibireo@www.ynde.solveborg.se and you are in. Bo Sandqvist, who tends the list, will redirect all messages he receives to all subscribers. Wonder where the name comes from? Alibireo, the head star of Cygnus the Swan is of course the Swedish double star. One blue, one yellow!

Why don't you already mark 22-24 August 1997 in your calendar? These are the dates of the 14th NPA Conference to be held in Göteborg with Per Broman as Conference Chair. This meeting is planned to be more international than usual, and planetarians from the other European countries are being invited to attend. Send Per a note if you want an invitation sent to you.

**Pacific Planetarium Association**

The fall 1996 meeting of PPA was hosted by Fleischmann Planetarium, University of Nevada, Reno 10-12 October. Highlights of the conference included demonstration of the planetarium's new Pioneer Linear Loop 8/70 motion picture system, a new original show *Cosmic Conclusions*, a star gaze under dark sky conditions in Washoe Valley with a 24-inch telescope belonging to the Astronomical Society of Nevada, and an optional Sunday morning Lake Tahoe cruise on a paddlewheel steamboat.

**Rocky Mountain Planetarium Association**

The Rocky Mountain Planetarium Association held its annual conference in conjunction with SWAP, GPPA, and AMPAC 18-21 September at the El Paso Independent School District Planetarium in El Paso, Texas. The meeting hosted over 108 participants from a wide region, with great activities. Among them were numerous paper sessions, workshops, laser demonstrations, vendor presentations, a trip to El Paso's LBJ NASA facility to see the Shuttle Training Aircraft, a tour of the new "Insights" Science Museum (complete with tequila machine!), and memorable door prizes. A special steak BBQ dinner at the Tour Indian Cliffs Ranch outside El Paso featured guest speaker Alan Hale, as well as a hayride to a star party hosted by the El Paso Astronomical Society (the site for observing was also the movie set for *Courage Under Fire* - telescopes among the tanks!). Next year's meeting site will be the Kansas Cosmosphere in Hutchinson, Kansas, combining again with several other regional organizations.

**Russian Planetarium Association**

On 18 September, the Council of Russian Planetarium Association (RPA) met in Kaluga. One of the items discussed was the Russian-Ukrainian Planetarium Conference. It will be held in Kiev, Ukraine in May 1997. If you want to attend the meeting and visit one of the most beautiful cities in the world,
please do not hesitate to contact Ivan Kryach'ko, Director of Kiev Planetarium, using the address of Ukrainian Planetarium Association (on page 4). The information is also available from the RPA Board via e-mail sitkova@appl.sci-nnov.ru

Southwest Association of Planetariums

The joint SWAP, RMPA, GPPA, AMPAC Conference in El Paso in September '96 was a big hit. SWAP elected the following officers for the 96-97 biennium:


Some of the other important items discussed were the need of our membership to communicate more often with one another. Another item of concern was the large number of planetarium personnel in the region who do not participate in SWAP either because they do not even know about SWAP or for other reasons. If anyone would like to join or become more active in SWAP, they should contact any of the above officers.

Next year's conference will again be a joint conference, in Hutchison, Kansas (which is closer to many of us than El Paso), with the tentative dates of 24-27 September 1997.

SWAP would like to welcome several new (or returning) members: Jan and Mark Wallace from Andrews, Texas, who are returning to our ranks after a long absence. (We're really fortunate to have you guys working with us again!), Steve Schmidt who is the director of the Midland Planetarium. Aaron Guzman from the Amarillo Planetarium, Ben Randell from Oklahoma Baptist University, Dr. Jim McConnell from Richardson ISD, Stephen Balog who is director of the St. Mark's Planetarium in Dallas.

The Angelo State University Planetarium has now been open for eleven years. During the first ten years, over 100,000 children visited the planetarium. They had a big turn out for a Comet Hyakutake party—about 400 in our parking lot looking at the comet through telescopes. They are planning for a large crowd during the Hale-Bopp primetime this spring.

The Richard King H. S. Planetarium in Corpus Christi, Texas, is getting a new computer and printer, reupholstered seats, a modest budget, and upgrades on some of the projection equipment.

Mary Kay Hemenway in Austin Texas has been busy as the Project Director for the American Astronomical Society Teacher Resource Agents program. She has 215 teachers from across the US in the program, and they have all been prepared as workshop presenters in astronomy. Many of them have problems finding locations and audiences for the workshops they are prepared to present. Further information is available at her web site: http://www.aas.org/aastra/aastra.html.

If any one would like to help sponsor a workshop, or help one of these teachers in any way, please contact her. AASTRA will be sponsoring two short courses at CAST (Texas State Science Teachers meeting in Austin on 31 October and 1 November) and a special session at the NSTA Global Summit in San Francisco in December.

The AISD Planetarium (Andrews ISD, Andrews, TX) had over 300 people attending their 20th Anniversary Open House Program (a short video to give a historical perspective of the facility and then a short live show about the total lunar eclipse). Four shows were scheduled, but when it was all said and done, they had seven shows. Middle School science teachers also set up two telescopes on the north side of the building housing the planetarium and over 300 people lined up at various times to view the moon, Jupiter, and Saturn.

The planetarium at the University of Arkansas also had an Open House with about 300 people as they hopefully tried to view the lunar eclipse. Three hours before the eclipse, they had thunderstorms and tornadoes passing by. They actually saw the first 20 minutes, but then it went completely overcast. They also now have a web page at http://fermi.uah.edu/planetarium.html.

The Kirkpatrick Planetarium in Oklahoma City is doing a pre-school program based on the book Papa, Please Get the Moon for Me by Eric Carle. He is one of the best known writers for very young children. Their agreement doesn't include distribution to other planetariums at this point in time, but they've left open that option should it prove popular.

Don Garland, Noble Planetarium in Ft. Worth, was the guest on 1080 AM from 1200 to 2000 on September 26th. Donna Pierce (Richardson ISD Planetarium in Dallas) called in and they both got to tell the listeners about the lunar eclipse, Saturn being near, Comet Hale-Bopp, etc. It was fun!

The Don Harrington Discovery Center (Amarillo, Texas) was rained out for their planned eclipse observing session. They began laser shows with LFI in October and will continue through January 5th. ☆
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It's amazing sometimes what you can find at computer flea markets. "Visions of Mars" is one of my recent finds.

This CD ROM is a collection of text, images, and sound files about Mars assembled by the Planetary Society to be sent as a sort of time capsule to Mars on the Russian Mars 96 (formerly Mars 94) mission scheduled for launch in late 1996. Unlike the disks attached to the Voyager spacecraft which were designed to communicate to alien life forms about life on Earth, this disk is a message to ourselves - or more precisely our descendants who, it is hoped, will one day colonize the planet Mars.

The disk is a reminder to those descendants that many humans before them have envisioned voyages to the red planet. As such it includes the text of many authors who've written of such journeys. In addition to the more familiar works (e.g., Ray Bradbury's The Martian Chronicles and Arthur Clarke's Sands of Mars) you'll also find Garrett Serviss's Edison's Conquest of Mars, Report on Canali by Schiaparelli, and an excerpt from Lowell's Mars as the Abode of Life. In all there are 76 different books, book excerpts, articles, and short stories about Mars.

While the text archive of "Visions of Mars" is its most extensive component, it also has an interesting gallery of 63 pictorial 'visions' of Mars by such artists as Chesley Bonestell, Don Davis, Michael Carroll, Pamela Lee and Jon Lomberg. Unfortunately many of the images are pulp magazine covers and 'refrigerator art' by young children.

The third major component of this CD ROM is a small collection of sound files introduced by actor Patrick Stewart. These include the complete Orson Wells broadcast of "War of the Worlds" and brief greetings from Carl Sagan, Judith Merril and Vyacheslav Linkin. Of particular interest is an excerpt from a radio interview which brought together both Wells (Orson and H.G.) in the same radio studio.

This CD ROM is a dual MAC/PC format. It loaded quickly and easily on my IBM clone. It requires either a color MAC running system 7 or a PC with a 386 or better processor, 4 MB RAM, SVGA, a sound card, and Windows 3.1 or greater.

The user interface for this CD ROM is one of its weakest features. The navigation controls are not very intuitive and certainly don't follow common formats for today's GUI software. For example, instead of the usual "BACK" button with a left pointing arrow you'll find the word "RETRACE". And, instead of a menu page, look for "CONTENTS" and "REFERENCE" pages. The text files display in an 'open book' format with a left hand and right hand page. Rather than clicking on an arrow, you click on the edge of a page to turn it to the next one. A simple search function allows you to locate specific words within the document. Unfortunately you can't highlight a selection and copy it to the clipboard for easy pasting into another document. This is an annoying shortcoming for anyone who might want to quote from the assembled works on the disk. You can get around this roadblock by opening the individual files on the CD ROM with a word processor. Fortunately they're stored in the .RTF format.

Although "Visions of Mars" has a number of weaknesses, it could be a valuable resource for any planetarian to use in developing a Mars planetarium show, especially if the show included any history or cultural aspects. It was certainly worth the $12 (U.S.) I invested in it at the local computer show.

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Chapel Hill, North Carolina
27599

After Feeding Baby

Recycling's all the rage nowadays. But there are lots of planetariums that have been recycling for years, and really souping-up their visual presentations in the process. Through the use of old glass jars and small motors, some domes have built up batteries of visual devices that bring new life to their shows. Known ubiquitously as babyfood jar projectors (sometimes shortened to "BFDs"), these amazingly versatile little workhorses can turn a planetarium dome into an alternative space environment, as well as a "killer" light show display.

Known ubiquitously as babyfood jar projectors ... these amazingly versatile little workhorses can turn a planetarium dome into an alternative space environment, as well as a "killer" light show display.

Rick Pirkko of the Ward Beecher Planetarium in Youngstown, Ohio, is one of the planetarium field's babyfood jar wizards these days, and has developed and used a wide variety of these projectors for various effect applications—borrowing and building on the ideas of such BFD-gurus as former Bishop Planetarium (Bradenton, Florida) staffers John Hare and Joe Hopkins. From light sources, to image patterns, to mechanical design, Rick has become a quintessential authority on these little machines, and as such has been a valuable resource in the writing of this article.

Of course, these devices are "brute-force" projectors, and as such are different in concept from the sort of optical special-effect contraptions built around filmstrip and single-shot slide projectors. Instead, BFDs are more like most Spitz or other pinhole-style star machines—incorporating a tiny, bright light-source, surrounded by a "patternized" envelope with dark and clear areas corresponding to the patterns designed for projection onto the dome.

These little contraptions are dirt-cheap and easy to build. And they're great for large or all-dome effects such as clouds, erupting geysers and volcanoes, and rising smoke plumes. Figure 1 depicts in cross-section the basic layout of the babyfood jar projector, which consists of a motor-rotated babyfood jar, surrounding a small incandescent lamp and socket. By painting, or otherwise applying a pattern onto the outside of the jar, moving forms and shapes can be magnified and projected onto the dome. Both lamp-socket and motor are attached to thin vertical metal supports, which are then screwed onto opposite ends of a small plywood base.

In addition, some means of blocking the light-spill from the jar mouth must be fashioned. As in Figure 1, Rick cuts a round hole into the center of the jar-lid just a touch larger than the lamp socket, then screws it onto the jar, where it rotates around the socket as the attached jar is spun by the motor. (The hole-cutting in the jar-lid is done with a brad-point drill bit, which can be found at many hardware stores. Unlike the standard metal-cutting twist drill, a brad-point bit has its forwardmost cutting edges—other than the centered brad-point—around the outer areas of the bit, which are designed to cut the perimeter of the hole first. This makes the brad-point bit ideal for cutting thin sheetmetal, which would get distorted if drilled by a twist drill.) Another option that I've used successfully for light-blocking is to attach a thin, circular, black-painted metal disk behind the socket and its upright support. The disk should be a little larger than the jar's mouth to prevent all the unwanted light spillage.

The jar is attached to the motor via a specially-made hub (Figure 2). Rick makes his hubs using a larger-diameter flat-head machine screw—center-bored for the motor shaft—and a jar-bottom-sized disk, as well as a machine nut and a small set screw. The disk itself of course is center-bored in a lathe, or by using a special technique with a drill press (outlined in The Planetarian, June 1996, "Planetotechnica: Shaft Couplings Without a Lathe", but in this case, get a screw long enough to place the head above the jaws inside the drill-chuck so that the threaded end protrudes below the jaws—you can cut the screw to length later). Finally, the screw is side-drilled and tapped for the set-screw and then assembled. The hub is then attached to the jar-bottom using epoxy. When gluing the hub to the jar, carefully measure the position of the center-drilled motor-attachment screw relative to the jar's center axis—ensuring that the epoxy sets up with as symmetrical an arrangement as possible. The closer the hub-screw is to jar-center, the less mechanical wobble the jar will have as it spins. This is particularly critical when using the jar-lid for light-blocking the mouth, as the lid's center hole cannot be allowed to bind up against the lamp socket during rotation.

Another strategy for attaching a hub to the jar is to forego the acrylic disk altogether and drill a hole in the center-bottom of the jar for the hub-screw. This can be done carefully using a lathe or drill press (at the slowest speed setting) and a glass bit or sharp masonry bit—liberally doused with mineral

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spirits. In this approach, keep in mind that the hub screw should not have a flat head, as the underside of the head should be flat, not conical, to contact the glass as broadly as possible. (Actually, to protect the glass from stress when mounting the screw, it's best to use two flat washers on either side of the hole.) And when drilling the glass—especially when first trying this procedure—expect to break a jar or two, so work gloves and goggles are a must. The breakage problem can be minimized, though, if you keep the bit wet with mineral spirits and use very low bit-contact pressure for the cutting operation. The real advantage of this approach is that it avoids the vulnerability of epoxy and acrylic to very high heat if the projector needs to stay on for really long periods. But you do need to tighten the screw and nut to keep from cracking the jar when it heats up. The best way to avoid that is to turn screw and nut until they're only finger-tight, then place a few drops of fingernail polish or enamel paint on the threads to serve as a light-duty thread-locking compound.

The selection of a lamp is critical to the final appearance of the projected images. Usually, you'll want to make the images reasonably sharp, and for that, it's important to choose a lamp with a small filament. (Of course, for this type of brute-force projector, it's imperative that the glass envelope of the lamp be transparent rather than frosted.) However, the larger the dome, the more difficult it is to find lamps with small filaments and adequate light output. But Rick has found that a #1493 lamp fits the bill for many facilities. Designed as a microscope illumination lamp, the #1493 has a tightly coiled filament roughly the size of a flea. Yet, despite the small filament, this 6.5-volt unit is rated at 18 watts, and 290 lumens light output. Of course, the lamp-voltage requires a 6-volt transformer with a beefy 2.5-3.0-amp current rating for operation. In the case of small domes, a #605 lamp works pretty well. This option is a 6.15-volt, 3-watt unit, with a light output of 43 lumens, and requires a 6-volt transformer with at least a 0.5-amp current capacity.

Because of their small size, BFDs can be placed nearly anywhere, though they're used most often when placed in a lighting or projection cove. This positioning makes their light hit the near-dome areas at a shallow incidence-angle, while the across-dome regions get a much more square-on hit (Figure 3). Typically, these projectors are positioned with their axes of rotation tangential to the dome perimeter (Figure 4—an overhead view looking down into the cove)—though there are some interesting variations possible, which we'll touch on shortly. Also, the greater distance to the across-dome areas spreads out the images and is great for large effects like clouds. Such an effect is best achieved in a unidirectional-seat dome by placing the projector at the rear of the planetarium. To precisely match the light-masking of the effect to the opposite-dome horizon line, elevate the projector so that the lamp filament is level with the cove lip. In addition, to minimize the bright concentration of light on the dome behind the BFD, you can attach a black cardboard mask of the desired height to the dome-side of the projector.

Because of its placement, a cove-mounted BFD throws light in the near-dome areas so that it splays outward to either side as it rakes up the dome (Figure 5). This characteristic is great for creating volcanic eruptions and smoke rising from the horizon, and is achieved by positioning the projector in the cove section out in front of the audience. On the other hand, the projector can be reoriented to align its spin-axis radially with respect to dome center (Figure 6—an above-cove view). This arrangement creates a looping pattern to the light (Figure 7) which is great for creating solar prominence effects—especially if the projector is tilted slightly toward dome-center. However, this orientation can be difficult in low-depth coves and may require a projector which is smaller—as measured along its spin-axis.

For this application, Mr. Pipko has created a modified design which has the motor and the lamp connection/support on the same end of the projector (Figure 6). In this variant, the jar-lid is attached to a gear rotating around a fixed arbor, and the jar is screwed into the lid. This jar/gear/lid combination is driven by another gear down below—mounted onto the motor shaft. The support for the projector mechanics is provided by a L-shaped support, which Rick fashions from two sections of acrylic sheet glued together with special acrylic cement to form a 90-degree angle.

The lamp's electrical connections and mechanical support are routed through a center-bore in the specially-made arbor.
The mechanical support is simply a piece of 14-gauge solid copper wire which is soldered onto the lamp base and bent in a manner that fixes the lamp position inside the jar. The exterior surfaces of the arbor are machined with threads on one end—for mounting with a hex nut to the acrylic support—a stop-shoulder in the middle, and a spindle for the rotating gear at the other (jar-lid) end. Completing the arbor is a groove cut into the end of the spindle-area for a snap-ring—designed to retain the spinning gear in place.

This ingenious design—while effectively reducing the length of the projector—does require specialized machine work on a metal lathe to fabricate the arbor. Those not possessing the appropriate equipment and expertise to make these arbors should consider contracting with a machinist to get this part made. While machinist costs aren't insignificant, you can reduce the per-unit cost by having multiple arbors done at one time. This will share the "set-up" charge amongst all the arbors, and should make the cost more manageable.

Jar patterns can be created by applying flat black paint directly to the glass. In the case of naturally-appearing phenomena (clouds, smoke, etc.), the patterns can be applied freehand with brush-on paint. Trial-and-error experimentation will give you a good feel for how the painted patterns translate onto the dome. Random blobs of black paint with soft, feathered edges can work well to create clouds, while a striated, slightly wavering clear band around the circumference of an otherwise black jar will work well for solar prominences, geyser plumes, and rising smoke.

Another strategy for creating patterns involves scratching selected areas of a fully-painted jar with an awl, razor-blade or X-acto knife. In addition, colors can be added to the projected light patterns, either with a piece of colored acetate attached arch-style around the projector, or with stained-glass paint (found at hobby and craft shops) to fill in the otherwise clear areas of the jar.

More artificial-looking patterns (as in Figure 10) can be created with graphic artists' line tape, or adhesive color-code identification dots—to serve as mask patterns—and some flat black spray paint. While these sorts of patterns usually don't led themselves very well to star shows, they are great for use in laser shows—particularly with faster motors spinning them. Simply press the tape into place onto the outside of the jar—rubbing the tape down for adhesion to any paint from under it—and spray-paint with several coats until the filament of an incandescent lamp placed inside is invisible through the paint. Removing the tape cleanly afterwards—in the case of line tape—is achieved by pulling the tape off at roughly right-angles to its orientation on the glass. This minimizes the amount of paint peeling beyond the edges of the tape.

Of course, you aren't only limited to babyfood jar projectors. Larger, taller, and fatter jars can also be used. In the case of taller jars, you could employ another Pirko technique and generate more complex and freehand-style patterns on overhead transparency film for photocopiers and laser printers. Simply start out by creating a pattern—such as the clouds in Figure 11—with black marker and paper, or with a painting or drawing program on your computer, and photocopy or laser-print it onto the transparency film. To get a dark enough density in the black areas, print out two transparency copies, and sandwich them together before rolling them onto the jar—taping the transparencies around the jar circumference near the jar's top and bottom. The additional advantage of using two transparencies is that you can slightly offset the patterns when sandwitching the film, and this softens the otherwise hard-edge of a pattern—great for more natural-looking clouds and other such effects. You can create lots of fun stuff with transparencies, too—such as patterns of musical notes, as well as skulls and bats for your Halloween shows. The possibilities here are limited only by your imagination.

But it's also possible to use this general projector design without installing a jar at all. Instead, you can substitute a clear drinking glass—a move which opens up another realm of possibilities. Glasses with spiral or other ripple-designs (as in Figure 12) can produce great light-refraction patterns on the dome without using light-blocking paint or transparency patterns at all. And the addition of paint patterns in addition to the glass ripples can add even more variants to the image possibilities. For some effects, you can even forego glass altogether and make pat-
tern-cylinders using bulk film-cans (for the motor-hub end) and pattern-stamped sheet-metal rolled into a cylinder and fastened to the can. Or you can roll hardware cloth around the can to support a black paper or aluminum foil cylinder with punch-out patterns. But perhaps those are better left to a later installment.

The great thing about babyfood jar projectors is that they are really easy to build, and are super-cheap. And these little effects workhorses are so versatile, that you'll find they keep evolving into new variations that will supply your theater with all sorts of dynamic, fun visualization in a seemingly never-ending stream. So just as baby fills his or her stomach, you too can fill up your planetarium with a delectable smorgasbord of visual delights.

Enrichment: Productive habits of mind will be established as students have the opportunity to use this newly gained knowledge meaningfully through the investigation and research of library references and literature relating to the historical events of the mid nineteenth century in the United States.

References:
Rall Gloria, Follow the Drinking Gourd, Planetarian Vol 23, No 3, September 1994, p 8-12
Well ... are they or aren't they?
I'm referring, of course, to those little wormy forms in the now-famous "Mars meteorite"—certainly what's new lately, the announcement of their discovery hardly two months old as I write. So are they teeny fossilized bacteria from a bygone era on a more hospitable early Mars, leaving behind carbonate deposits and concentrations of iron-rich minerals? Or are they microscopic mud patterns that are leading us all on a merry chase?

If scientists ever reach a consensus after more study, now that will be news. It's tantalizing and exciting nonetheless, and makes for a wonderful public display of the process of science—something to which the public is all too rarely exposed, at least on topics that have a chance of catching their imaginations.

At least no one can argue about the fortuitous timing of the announcement, just months before the inauguration of the latest series of missions to the Red Planet. If all has gone well, Mars Global Surveyor should be on its way, and Mars Pathfinder on the verge of launch if not already on its way as well, carrying its semi-intelligent rover ready to putter about, assuming the craft survives its crash—er, airbag "landing" on the surface. It should all make for a more interesting opposition of Mars early next spring in the appropriately-named month of March, when the planet is once again prominent and we can talk about the upcoming missions and the doubtlessly on-going saga of the Mars meteorite. Time to dust off those Mars shows again.

Speaking of which, you may wish to make note of the first item up for discussion ...

Mars Shows

The Burke-Baker Planetarium at the Houston Museum of Natural Science announced last summer that it's producing, in conjunction with Houston's NASA Johnson Space Center, a planetarium program simulating a proposed 2018 mission to the Red Planet. The show is called "Destination Mars." The 40-minute program features the voices of six U.S. astronauts including Gene Cernan, the last (real) moonwalker, and concentrates on searching for geologic evidence of life—Mars meteorite included. According to my information, show materials include script, show tape, video for more than 70% of the program, supporting slides (mostly from Viking), pan sets, all-skies, and Kodakith, plus plans for a supporting exhibit.

In recent months, the Burke-Baker staff has been surveying people to determine distribution formats and costs. If you'd like to still offer your thoughts on such, or inquire about obtaining the show, you can contact Carolyn Summers, Houston Museum of Natural Science, 1 Hermann Circle Drive, Houston, Texas 77030 USA, telephone 713-639-4632, fax 713-639-4635, e-mail <summers@alfven.rice.edu>.

I haven't seen any of the show elements yet myself; if I do, I'll pass along my impressions. But it all sounds very timely; you could have it up and running in time for Pathfinder's bouncy landing next July, according to the Burke-Baker people.

Incidentally, I seem to recall that a while back, Loch Ness Productions announced that it had revised its "The Mars Show," another fine choice for a good general show that deals with Mars in myth, in science, and as a target of exploration. We've run it at our facility, and it's quite excellent, with Loch Ness' characteristic crisp writing, lovely score, nice visuals, and a knockout narration by Patrick Stewart. Check with the Nessies as to availability and cost.

Loch Ness News

Speaking of same, you may have heard by now (but in case you haven't) that Loch Ness Productions is relocating to the Boston area, lock, stock, and Larry Cat, where Carolyn Collins Petersen will be working for Sky Publishing as its new Books and Products Editor, and Mark Petersen will be setting up the Nessie operation. Since they're probably in transit, you don't have a new address yet, but you can probably still contact them through their old one (P.O. Box 3023, Boulder, Colorado 80307 USA), their Web Site (<http://www.Lochness.com>), their personal e-mail addresses (for example, <mark@Lochness.com>) or their new toll-free number 1-888-4-NESSIE (1-888-463-7743 if you're like me and take three minutes to figure out which letters go with which numbers).

Loch Ness has also announced that they're in the process of redoing their "Light Years from Andromeda" program about light speed and distances in space, with all-new visuals by Tim Kuzniar and Michael Carroll. It was announced as being available in December, but check their Web site (given above) to see if the move has delayed anything. I'm not familiar with the program, but as soon as they've resettled and they can send me snippets, I'll report further.

Also, I hear that Carolyn's and John Brandt's popular and well-received Hubble Vision book is in its second printing, and the duo is working on the second edition, due out in late 1997.

Loch Ness is also out with its latest edition of the LNP Planetarium Compendium, bigger than ever and still $25 US. The compendium lists more than 2,500 planetariums (including portables sites) throughout the world, indices of planetarians, planetarian e-mail addresses, world-wide web sites, and planetarium model sites, plus assorted statistics (now including Loch Ness' estimates of planetarium attendance). Excellent reference, with loads of information. Inquire as given above.

Additionally, I've recently acquired a copy of the Nessie "Original Artwork Image Library," a catalog of slides available for in-house use in planetariums. Items include telescopic artwork views of planets and selected deep-space objects (a must for every planetarium), and assorted original-art views of solar system objects, stellar and galactic objects, spacecraft, mythological figures, planet size comparison and cut-away interior views, graphics, landscapes, panoramas, constellation outlines, and holiday themes. The images are presented as black-and-white pictures in the catalog, similarly to the Strasenburgh and Hayden slide catalogs. Some of the art I recognize from various Loch Ness shows, and all of it looks good. The slides are $12.50 each for in-house use only, and come glass-mounted and masked. It's nice to have another source of high-quality slides, and if I'm not mistaken, the catalog is also on-line at the Loch Ness Web site.

The catalog indicates that the artwork is also available in electronic form and for non-planetarium, non-projected uses at a higher pricing scale. Check with Loch Ness for details.

Good luck to the Nessies in Boston! No mountains to speak of as in Colorado, but all the baked beans and cream pie and "paeking of cahs" you could possibly want ...

Comet Shows Are Coming!

While I'm on the subject of shows, I'm aware of two other timely offerings available from planetariums. Comet Hyakutake may have sneaked up on us out of the void and bitten us on the—well, wherever sneaking comets bite, but there's no excuse for being
unprepared for Hale-Bopp. And the Adler and Buhl Planetariums aim to help.

The Adler Planetarium's offering is called "Comets Are Coming!" It's a 30-minute program written by comet hunter extraordinary David Levy and features an "in-depth look" at comets with more than 240 slides, soundtrack, script, and production notes, for a cost of $795 U.S. The program includes interview snippets with Messrs. Hyakutake, Hale, and Bopp—which makes it very current indeed—with a segment dealing with Comet Shoemaker-Levy 9's fateful encounter with Jupiter as well.

I had a chance to see the program as produced by the El Paso ISD Planetarium in El Paso, Texas, last September, during the RMPA/SWAP/GPPA/AMPAC Conference there, and the show is nicely done, with lots of information on comets, and lots of information on the recent and current comets mentioned above as examples of the genre. For more information and/or a demonstration tape, you can contact Larry Ciupik at 312-322-0313 at the Adler Planetarium, 1300 South Lake Shore Drive, Chicago, Illinois 60605.

The other offering comes from the Buhl Planetarium at the Carnegie Science Center, One Allegheny Avenue, Pittsburgh, Pennsylvania 15212 USA, telephone 412-237-3400. It's called "Comets: From Ice to Fire," and is described as a program chronicling the "life spans of the most famous cometary apparitions," with images of Comet Hyakutake and information on viewing Comet Hale-Bopp. The program is priced at $695, and is scheduled for release in time for Hale-Bopp's plunge toward the sun over our heads early next year.

At the time of this writing in October, the program is in production, and I haven't seen any show elements yet. But my information says that the program will include a 30-minute audio tape, slides, and "the latest video graphic simulations of cometary evolution." Check with Martin Ratcliffe at the Buhl for more information and perhaps for some sample bits; as you read, the program should be just about ready to go.

Dinosaurs and Moonwitches

While I'm still on the subject of planetarium shows, let me also mention that Joe Hopkins Engineering has a new show out called "Dinosaurs." And that's what Joe Hopkins says it's about—not about space, not so much about something from space killing them, but a show about dinosaurs themselves: what they were like, where they lived, what they ate, how they may have died, how we found out about them, and if there are any left. I haven't yet seen any script or heard any tape, so I can't elaborate any further at the moment, but I did have an opportunity to see some of Joe Tucciarone's dinosaur artwork in the form of slides at the El Paso conference. And it's wonderful stuff—colorful, detailed dino images that would be great to have.

My information says the show is 30 minutes long, includes 150 slides, script, and soundtrack, and costs $795 U.S.

Still available from JHE are its family program "Bear Tales (and Other Grizzly Stories)," its planetarium introduction show called "Welcome to the Universe," and "Daughter of the Stars," a compilation of Native American sky myths. The company also offers programmable audiovisual control systems and custom work. For additional information on "Dinosaurs" and other products and services, check with Joe Hopkins Engineering, P.O. Box 14278, Bradenton, Florida 34208 USA, telephone 1-800-JHE-5960.

I've also had an opportunity lately to see elements of Bowen Production's most recent Astro Notes show, called "Moonwitch." It's been advertised for a while, but it wasn't until El Paso that I'd had a personal opportunity to see the Phil Groce script and Jim Chapman artwork, and both are first-rate. The program is designed especially for younger school grades (2nd through 5th) and covers the appearance, motion, and phases of the moon within an engaging story set around Halloween.

"Moonwitch" runs 17 minutes, includes soundtrack (with a Jeff Bowen score in DAT, 1/4-inch 2- or 4-track, cassette or custom formats), 55 slides, and costs $375 U.S. (when payment accompanies order) or $400 (by pur-chase order).

Bowen also has two other Astro Notes productions available: "Sandy, Pepper, and the Eclipse" on solar eclipses, and "Lifestyles of the Stars" on stellar evolution. Bowen also offers a wide variety of custom scoring and planetarium development services. For more information, contact Bowen Productions, 3590 North Meridian Street, Indianapolis, Indiana 46208 USA, telephone 317-923-3883, fax 317-923-3871, e-mail <bowenprod@aol.com>, for more information or to order.

I'd Like to be an Astronaut

Earlier this year, April Whitt informed me of a new product series from Twin Sister Productions, 1340 Home Avenue, Suite D, Akron, Ohio 44310 USA, telephone 1-800-248-TWIN (8946) or 330-633-8900, fax 330-633-8988. The series is called "I'd Like to Be A ..." and is comprised of kits designed to help kids learn about different sciences and scientists, and what it takes to be one. Each kit contains an audiocassette and 24-page "lyric

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activity book with realistic illustrations, coloring pages and brainbuster fact sheets for enrichment learning,” according to the company's color catalog. Presently, you can learn if you’d like to be an astronaut, paleontologist, entomologist, marine biologist, chemist, zoologist, meteorologist, or physicist.

The company sent me the astronaut kit which included a cassette tape of twelve songs and the booklet which included all of the lyrics, plus some fact pages and colorable drawings. The concept is great; the materials concentrate on encouraging kids to think about the possibility of becoming an astronaut, and that getting along with others, being physically fit, and studying hard in school are important in becoming one. In addition, such concepts as gravity and what a satellite is are touched on, and other songs and information bits discuss Skylab, how the space shuttle works, famous past astronauts, space colonies, and even the Challenger accident. Many of the songs have interesting tunes and are sung by good (mostly adult) voices, and some have short spoken segments embedded within to provide additional information. And the right to reproduce pages of the booklet for classroom use is granted with purchase.

I do have a few quibbles, however. I think the vocabulary (especially in the songs) is pretty daunting—at least for the lower end of the 4-9 age group for which the kit is intended. When song verses include words like “hypotheses” and “phenomenon,” I think you may want to prepare a vocabulary list even for the upper end of the age range. Many of these are not simply-worded songs; some of the stanzas are formidable, and some of the verses and rhyming sounds forced—perhaps because the authors are trying to cram too much information into some of the songs. It might have been better to add more spoken or written pieces to supply the information, and to have crafted simpler songs more likely to stick with kids. Invariably, the songs I liked best were the ones with shorter verses, simpler and catchier choruses, and which concentrated on a single concept.

Generally, the fact pages come off better, with a more appropriate level of vocabulary. But I see missed opportunities—for example, in not saying why Skylab “was a way for us to learn more about the earth and about the sun,” or what it really means to “walk in space.” The drawings are good, although I have one small quibble with the reentering shuttle, which looks like the entire craft is on fire.

I like the concept of the kit a lot, and there’s much of value here. But I think it definitely needs an enlightened parent or a teacher prepared to explain words and concepts to guide kids through much of it. And that may well be the point, considering that the booklet has a note to parents and teachers to “read aloud the informational pages to encourage children to learn more about space history, famous astronauts, and the future of space travel.” Still, I wouldn’t expect kids to walk away singing many of the songs by heart.

My opinion, but then what do I know? According to my information, I’d Like to be an Astronaut has received an Award of Excellence from The Film Advisory Board (“dedicated to the recognition and promotion of quality family and children’s entertainment”) and has been approved by Dr. Lynn Bondurant, Education Programs Officer at the NASA Lewis Research Center. So do check out the product and decide for yourselves.

I’d Like to be an Astronaut and the other “I’d Like to Be’s” sell for $998 U.S. In addition, the company markets other kits in the same audiocassette/booklet motif (many of them also winners of awards) including an Early Childhood series ranging from nursery rhymes and phonics to letters/numbers and colors/shapes; a math series; and a foreign language series. Contact Becky Reiter in sales for more information.

Thanks to April for alerting me to this interesting concept in product lines.

Music, Music

In one of last year’s columns, I mentioned to watch for Mark Mercury’s next album, entitled Soliloquies. Well, watch no longer; it’s out, retitled as The Art of Space. But the soliloquies are still there.

The Art of Space is just that—a really lovely melding of music (composed by Mercury using electronic keyboards and synthesizers) and words (in the form of poetry with space themes written by John Fairfax, John Cotton, Rosser Reeves, and Brian Patten, skillfully recited by Richard Gould and Charmaine Blakely Budaska). The entire assemblage runs a full hour, as eighteen separate pieces mostly between one and seven minutes long.

I’ve listened to it all, and I really like it. The pieces run a spectrum of moods, from light and whimsical to rich and tonal. One mood (and piece) runs into the next, with periodic pleasant stops at poems that resonate both in the ear and in the mind, underscored by Mercury’s music.

Lovely idea, great music, wonderful poems, all beautifully realized as an artistic whole. And I recommend it for your gift shop and for your personal library.

The Art of Space retails for $12.99 U.S., $16 when you include tax and shipping. It can be purchased from Blue Chromium Records, P.O. Box 50358, Pasadena, California 91115 USA. Mercury’s previous release, Music of the Domes (reviewed in my March 1995 column) is also still available for $10 U.S. from the same source.

For additional information, contact Mark Mercury at 818-792-1480, e-mail <102147.1542@compuserve.com>. Enjoy!

Recently I’ve reviewed a sampler tape of several composer/musicians called Showcase #1 put out by Lyra Recording, 313 Raphael Avenue, Middlesex, New Jersey 08846 USA, telephone 908-469-7752. This is a new record label established by Gordon Bond and Gary Likert to offer the planetarium community a variety of musical options for show or video scoring and for gift shop sales. According to my information, they have 13 artists signed to their label, encompassing New Age, rock, jazz, classical, and ethnic styles.

The sampler showcases six of those artists (Jon Denzene, Matt Sweitzer, Mike Parisano, David Hayden, Keith Vivrette, and Scott Baily) and plays short excerpts of their work while providing bits of background on each—and from the sound of it, these people have a lot of professional experience. The styles are indeed varied, and all nicely executed. A more extensive sampler called Showcase #1 should already be available as you read, according to my information, featuring about six minutes from each of the thirteen, or almost 90 minutes of music. The cost of this sampler is $5 U.S. for shipping and handling.

Lyra offers these artists for gift shop sale, for custom scoring, or for use of existing music with limited in-house use rights. So here, under one label, is a stable of composers that can probably provide most any style of music you might desire—another nice idea. For more information on the Sampler #1 tape, and costs for various services and products, contact Lyra as given above.

Moontellers

The prolific Lynn Moroney is out with another children’s book, this one called Moontellers: Myths of the Moon from Around the World. It’s a delightful look at moon stories from a dozen different cultures, each of which saw something different in the naked eye features of the moon. Each story is succinctly told with supplementary information on the culture, and a color illustration by Greg Shue which incorporates a view of the moon showing what the culture saw in it. Included is the modern scientific “story,” world maps showing the locations of the featured cultures, and a list of story sources and additional reading.
Also available from the publisher is a teacher's guide called *Tools for Teachers: Teaching Curriculum for Home and the Classroom*, which offers a series of activities related to the book, from making a salt-and-floor map of the moon's features, to moon phases, to making up your own stories and pictures in the moon, to finding the North Star using the Big Dipper (this relating to the Polynesians, one of the featured cultures in the book, who used the stars to navigate).

It's a wonderful, colorful book, deftly written, and the teacher's guide makes some excellent connections between the book and useful, reinforcing activities. It's an excellent choice for your gift shop, not to mention your own library as a multicultural source of moon myths that involve looking at the moon to see what the tellers did. *Moontellers* retails for $14.95 U.S. The teachers guide is free, and can be photocopied for non-profit educational purposes. For more information or to order, contact Northland Publishing, P.O. Box 1389, Flagstaff, Arizona 86002 USA, telephone 1-800-346-3257. You can contact Lynn Moroney directly at Skytellers, 1944 N.W. 20th, Oklahoma City, Oklahoma 73106 USA, telephone 405-524-2152.

**Planispheres Revisited**

Last issue, I included in my column a description of Rob Walrecht's planispheres. Since then, he's sent me a sample of his English 60° latitude version (to go along with those for 30°, 40°, and 50°), and has indicated that he also has Dutch “holiday” planispheres for 40°, 50°, and 60° (for when Dutch speakers go on vacation to other latitudes, I presume) in addition to the standard 52° item. Rob also has plans to publish French (47°) and German (50°) versions of his product.

He also sent me a price list. The cost for his standard planispheres is $9.99 Dutch Guilders (about $5.30 U.S.) apiece for quantities of 1-9, with lower prices for larger quantities, down to 7.95 Guilders (about $4.25) for 100 or more. Custom planispheres begin at 11.23 Guilders (about $6) apiece for a quantity of 500, 829 Guilders (about $4.40) apiece for 1,000, and reduced per-item prices for larger quantities.

It's a nice product! For more information, see last issue's column, and/or contact Rob Walrecht, Fuutstraat 6, 3815 JP Amersfoort, The Netherlands, telephone/fax +31-33-4755 543.

**NASA and Hubble On-Line**

Dale Smith sent me a news item about a web site I'd not heard of before, called the “Photojournal,” which has been developed by the Solar System Visualization Project, the U.S. Geological Survey, and JPL's Public Information Office. It provides access to the NASA archive of “publicly released” planetary images for use by scientists, educators, publishers, and the public in general.

According to the news item, the site provides thumbnails and “browse-size” versions of images for preview, captions, and other information. The site also offers “direct digital downloading” in a variety of formats and styles and links to vendors from whom you can order photographs, slides, and CD-ROMs.

The photojournal can be accessed at <http://www.pdsimage.jpl.nasa.gov/PIA> or <http://www.pdsimage.wr.usgs.gov/PIA>, so have at it—and thanks for the tip, Dale!

Also, I picked up a “Hubble On-Line” brochure from Prue Campbell in El Paso which lists a number of ways to access the delights of Hubble from cyberspace—which Prue has also been diligent to mention on Dome-L. There are three ways via the Internet: through the World Wide Web at <http://www.stsci.edu>, through Gopher at <http://www.stsci.edu>, and through FTP at <ftp://stsci.edu>. The brochure offers a helpful step-by-step procedure for each method.

You can also receive the text of Space Telescope Science Institute press releases automatically by subscribing to the STScI Public Information list server: send an e-mail message to <listserv@stsci.edu>, leave the subject field blank, and in the body of the message, write “subscribe pio” followed by your name. You'll receive acknowledgment of your subscription, and then sit back and wait for the press releases to arrive.

**Hubble Off-Line**

Prue Campbell's Hubble brochure also had an insert listing off-line sources of Hubble images, and it's probably good to review them here as well.

Photos, slides, and negatives can be ordered through Newell Colour Lab, 221 N. Westmoreland Avenue, Los Angeles, California 90004, telephone 213-380-2980, fax 213-739-6984, e-mail: <info@newell-colour.com>, web site: <http://www.lainet.com/newell/>. Also, Space Images, P.O. Box 701567, Department H, San Antonio, Texas 78270, telephone 800-877-8915, fax 210-499-4504, e-mail: <images@netexpress.com>.

Slides can also be obtained through Finley-Holiday Film Corporation, Box 619, Whittier, California 90608 USA, telephone 800-345-6707, fax 310-693-4756, e-mail: <finley-holiday@finley-holiday.com>, web site: <http://www.finley-holiday.com/>; NASA CORE (Central Operation of Resources for Educators), Lorain county Joint Vocational School, 15181 Route S8 South, Oberlin, Ohio 44074 USA, telephone 216-774-1051 extension 293 or 294, fax 216-774-2144; Astronomical Society of the Pacific, 390 Ashton Avenue, San Francisco, California 94112, telephone 415-337-2624.

Note also and especially that there is now a contact for every IPS regional affiliate on the list to receive periodic releases of slides and information, and that these people are getting materials, and the affiliates are setting up procedures for access and distribution. Check with your local affiliate, or with one of the IPS officers if your region is not yet represented by an affiliate. Special thanks to Anne Kinney, Prue Campbell, and Cheryl Gundy for their assistance in getting this project off and running! Contact Prue Campbell if you'd like to get one of her brochures for ready reference.

**Space Mission**

A space education effort came to my attention not long ago—a business called Canti Astro-Space Activities (CASA), 1903 West Eighth Street, Suite 303, Erie, Pennsylvania 16505 USA, telephone 814-453-7700, directed by Christopher Centi.

According to the information I received, CASA offers outreach programs on astronomy and space to schools, museums and science centers, planetariums, youth groups, community and retirement centers. Current programs include “Planetary Encounters” (dealing with sizes, distances, and characteristics of the planets), “Reach for the Stars” (constellations, stellar evolution, astronomical tools), and “Rockets into Space” (the principles and history of rocketry and manned and unmanned space exploration). Each uses hands-on activities and demonstrations to present its concepts.

Contracting facilities supply a large room (or possibly an outdoor setting) with some tables, electrical outlets, and between five and 75 participants per session, and CASA does the rest. One to six 45-minute presentations per day can be scheduled, as well as general assemblies. The cost is $95 U.S. for one presentation, with additional prices quoted for any number up to a “full day” of six presentations for a total cost of $285. Assemblies are $145.

CASA also offers teacher/parent workshops, and a “Rent an Astronomer” program offering sky observing and/or rocket launches. Prices for these two are negotiable.

I'm not sure how far CASA travels, but for more information, you can contact Christopher Centi as given above.

**Stellarium**

At the El Paso meeting, I had an chance to see one of Jeff Carl's really big Stellariums—those three-dimensional displays of starry space around the sun, mentioned some years ago.
ago in a previous column. If you’ve been to the Air and Space Museum in Washington D.C., and have seen the eight-foot (2.4-meter), 715-star model installed near the end of the “Where Next, Columbus?” exhibit, you know how stunning the display can be.

The one Jeff brought to El Paso was just as stunning: tiny, realistically-hued fiber-optic (I think) stars filling a large cube of space around the yellow sun. The El Paso model also had a series of push buttons which lit little LED arrow markers that located the sun and some of the major or “landmark” stars occupying the given volume—in this case out to about 16 parsecs or so from the sun.

If you have an empty corner in your lobby or exhibit area (that you can make dark) and some budget, it makes a great exhibit—instantly giving a visceral sense of the sun truly as a star in three-dimensional space. Costs include a base price plus a price per star, both figures increasing with the size of the model. A one-foot (30 cm) diameter model with 50 stars, for example, costs $2,250 U.S.; a model 30 inches (76 cm) wide with 250 stars costs $5,250; an eight-foot (2.4 m) model with 800 stars would run you upwards of $60,000. Transportation is at commercial rates and installation is at cost, according to my brochure.

For more information and a full price list, contact Jeff Carl at Stellarium, 4560 Petaluma Hill Road, Santa Rosa, California 95404, telephone 707-586-0660. Web site: <http://www.wco.com/jeffc>.

Out of Osaka

Like all good conferences, the summer’s international gathering in Osaka also produced some news, new ideas and new products. Following are just a few technical examples, with more news to come next time.

Talk about everything old becoming new again ... Joe DeRocher from the Mueller Planetarium at the Cleveland Museum of Natural History, 1 Wade Oval Dr., University Circle, Cleveland, Ohio 44106 USA, telephone 216-231-4600, fax 216-231-9960, e-mail: <jderocher@cmnh.org>, presented a paper on the fiber optics reincarnation of the museum’s Hanna Star Dome, originally constructed in 1936—one of the first planetariums built in the U.S. and the first in Ohio. The one-ton, 16-foot (4.9 m) wide copper hemisphere was originally outfitted with nearly 3,000 six-volt radio lamps to display twelve different starfields—one for each month of the year with 250-300 stars displayed each month, the desired month selectable by a 12-position rotary switch.

Over a fifteen-year period, the Dome was inspected, all the star positions identified and labeled, and all the lamps replaced with fiber optics (providing the appropriate star magnitudes and colors) illuminated by a 60-watt General Electric Light Engine. The public can operate switches to choose the starfield of their choice, and Joe reports that this hands-on exhibit is very well-received by visitors.

The project is being supported by a grant from a local Cleveland foundation and from the selling of individual stars on the dome to the public; Joe says that it is considered to be the only 12-month fiber optics display planetarium in the world. And old is new again—and how nice it is to see a successful example of a way to preserve a bit of our planetarium heritage in a new guise and to keep it something of value. If you’re interested in learning more about the project, contact Joe DeRocher in Cleveland.

In another paper, Takayuki Ohira, 2-18-25 Minami-Ikuta, Tama-ku, Kawasaki-city, Kanagawa 214, Japan, telephone 81-44-976-1318 described a mobile planetarium system of his own devising, comprised of a main projector with two star balls projecting 45,000 stars, and a planet projector interlocked with the star projector by computer. The projector is housed under a 10-meter (33 ft) inflatable plastic dome accommodating up to 100 people.

Mr. Ohira has used the system in a number of venues and plans to develop the potential of mobile systems in Japan since he expects them to come into increasing use in a variety of applications. For more information on the system, please contact Mr. Ohira as given above.

Philippe Huyard of RS Automation Industries, ZI de la Vaure, Rue des Mineurs BP40, Sombrei 42390, France, telephone 33-77-53-30-48, fax 33-77-53-35-61, talked about his company’s newest planetarium projector which combines portability with greater technical capability. The new system, called Roving Star, employs a single star sphere projecting 1,500 stars and five computer-driven “mobile components” for projecting sun, moon, and planets, with the planet projectors capable of masquerading as different planets, meteors, or artificial satellites. The system also includes two slide projectors, a sound system, and a control system, with all components able to be operated either automatically or manually.

The Roving Star comes equipped with seats and is mounted on a trailer which can be towed by a normal vehicle, with an unfolding dome (of what size I’m not certain). Philippe indicates that among the advantages of the system are the ability to offer technically more accomplished performances in low-population areas and to erect the system out-of-doors for exhibitions or astronomical events. For more information on the Roving Star, contact Philippe Huyard as given above.

All-dome video projection of computer data bases has become an emerging technology among many planetarium manufacturers, and participants in the post-conference tour had a chance to see Goto Optical Manufacturing Company’s new “Virtuarium” system, in which four video projectors cast seamless images of three-dimensional computer data bases onto Goto’s very big test dome. It was impressive indeed (my only wondering was if it could be made a little brighter on so large a dome), and as closely as I looked, I had trouble detecting the boundaries of the separate video projections as we visited past planets, trekked through the stars, motored and flew through cities, and had a short skiing holiday with a puck Humpty Dumpty.

Other all-dome systems are being touted as well these days: Evans & Sutherland’s “StarRider” all-dome video projection system will have been demonstrated at the conference of the Association of Science & Technology Centers (ASTC) in Pittsburgh (in the Carnegie Science Center’s Buhl Planetarium) in late October, and I heard that Spitz has a new video projection system as well. I haven’t seen these yet myself, but if Virtuarium is an example, we’re in for quite a ride. Stay tuned as these various (and expensive) new technologies are refined and marketed; it will be interesting to see where they may take us ...

One final bit of technical news for the moment also occurred during the post-conference tour, when participants witnessed a collaboration of technologies at the Minolta Planetarium Company headquarters in the program “Powers of the Universe” produced by Phil Groce. The show combined a Minolta Infinium projector, an Evans & Sutherland Digistar II, the Omnican laser projection system from AudioVisual Imagining, and the Spice automation system by Sky-Skan, Inc. (with liberal use of video) to tell a story of our quest for knowledge of the universe. It was a masterful demonstration of the potential of combined technologies to present our messages—if one’s pockets are deep enough!

Of course, I’ve hardly scratched the surface of the doings in Osaka. Watch for additional items in future columns.

Libra Art

One of the vendors present in Osaka was LIBRA corporation, 665-8 Shimotsuruma, Yamato-city, Kanagawa 242, Japan, telephone/fax 81-462-72-6384, e-mail: <tabe@ykrim.or.jp>, a fairly young company which
offers services and products to the planetarium community in Japan and beyond. And one of their products is sets of postcards featuring the art of Shigemi Numazawa, a celebrated space artist/photographer whose images, real and imagined, are breathtaking.

Mr. Numazawa’s work ranges from photographs of eclipses and deep-sky objects to paintings of spacecraft, planets, galaxies, and futuristic cities on distant planets. The detail and color in all of them is quite marvelous.

The postcards come in sets of eight, and my sample set includes paintings of the Southern Cross against the Milky Way, constellation figures, dinosaurs, spacecraft, and a sunrise at Stonehenge. This is really lovely, colorful stuff, and would be very nice indeed for your gift shop.

Ishi Tabe, who runs LIBRA, indicates that postcard sets are available in assorted quantities, with 1,000 sets for a wholesale price of $3,000 U.S., or $3 apiece. The minimum order is 100 packets.

If you’re looking for some really good postcards of space art, consider these, and contact Mr. Tabe for more information and samples.

Free StarDate

The heading isn’t a slogan, it’s a notification—that the daily text of the nationally syndicated U.S. radio program “StarDate” is available to us free of charge, according to a message I’ve received from Dave Spector, product manager for Vision X Software, 761 Sproul Road #211, Springfield, Pennsylvania 19064 USA, telephone 609-428-2193, fax 610-566-3342, e-mail: <ds26@pipeline.com>, web site <http://www.visionx.com>.

Vision X and the University of Texas’ McDonald Observatory, which produces “StarDate,” have collaborated to create a freeware calendar program called “365 Days of StarDate,” where the daily text may be downloaded at <http://www.visionx.com/ddstar.htm>.

“StarDate” offers a daily nugget of astronomy on many radio stations; if you’d like the text, access away! For more information, contact Dave Spector as given above. Vision X offers other “DigiDay” titles ranging from “365 Days of Classic Quotes” to “365 Days of Bizarre.” Hmmmm ....

Cassini Alert

In October, my museum received a nifty new (albeit folded) poster on the Cassini mission from the Jet Propulsion Laboratory (JPL), which will launch in less than a year as you read. It’s eye-catching, with lots of useful information on the back. JPL also has unfolded versions available for display, and if you’d like one, contact Betty Shultz, Public Affairs Outreach Specialist, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, California 91109 USA, telephone 818-354-6278, e-mail: <betty.R.Shultz@jpl.nasa.gov>.

JPL and its parent Caltech are also thinking of making the poster available for sale through an outside licensee, in case you’d like to order a quantity for resale.

Ms. Shultz also informs that JPL is planning to develop other materials in “limited numbers” for educational purposes, and is circulating a “Product Survey Questionnaire” to help determine which products would be most useful for types like us, and where it would be best to spend their limited resources for these materials. Product possibilities include said poster, a 20-40 color slide set with captions, a 7-minute Cassini Mission video, educational CD-ROMs on the Saturn system and “Sensor Ways of Seeing,” a teacher resource guide on Cassini/Saturn subjects, a 32-inch by 42-inch (81 cm by 107 cm) Cassini Space Hologram, a 15-page color booklet contrasting knowledge of Saturn and exploration technology, and a Cassini Mission quarterly newsletter.

Ms. Shultz writes that at a future date, they will send out an information sheet giving procedures for getting this stuff. You may wish to call or write or e-mail her to register your interest and to get a survey card to register your preferences for materials. Some (most?) of this stuff is just what we’ll want to have as we wait for the spacecraft to make its dawdling way to the Ringed Planet. And it’s an international effort involving NASA, the European Space Agency, and the Italian Space Agency, so I think everybody should be able to ask.

Catalogs

What would the year-end be without a few catalogs to help fill those holiday stockings?

One that arrived too late for mention in the fall issue is the 1996 catalog of Sky Publishing Corporation, P.O. Box 9111, Belmont, Massachusetts 02178 USA, telephone 800-253-0245, or outside the U.S. and Canada, +1-617-864-7360. It’s chock-full as usual with books, atlases, maps, globes, posters, computer software, prints, and slides, and always there are new items, including quite a number relating to the Hubble Space Telescope and the Shoemaker-Levy 9 collision with Jupiter.

To get a catalog or order, contact as above. Or check out Sky’s web site at <http://www.skypub.com>; you can also order by e-mail: <orders@skypub.com>.

Another catalog I recently picked up comes from AstroSys, Inc., 5348 Ocotillo Court, Johnstown, Colorado 80534, telephone 970-587-5838, fax 587-4613, e-mail: <astrosys@fri.com>, web site: <http://www.fri.com/astrosys/>. The company is a supplier of telescope-building components, including kits for “truss tube telescopes” (azimuthal mounts with struts rather than a solid tube) starting at $899 U.S. for 10-inch (25 cm) telescopes and going up from there; primary mirrors starting at 10 inches (25 cm) for $450, and ascending; secondary mirrors and holders, dew guards, focusers, eyepiece adapters, tube connectors, bearings, clamp blocks, collimators, Telrad, star atlases, and guidebooks on telescope building. For a copy, contact as given above.

Finally, the year would hardly be complete without a romp through the latest Brainstorms catalog, filled with delightful, off-beat, and frequently grotesque items, many related to anatomy, given that this is a division of Anatomical Chart Company, 8221 Kimball, Skokie, Illinois 60076 USA. It’s an adolescent’s dream. Here are toys, novelties and even educational offerings to fit most anyone’s gift list. There are some astronomical items, including posters of the solar system and rockets, simple telescopes and “home” planetariums, and even a Hubble CD-ROM. There are also human anatomy charts and models, make-your-own volcano and geyser kits, and earthworm farms. There are also Klingon headpieces, toilet masks, the time-honored anatomically correct chocolate heart and gelatin brain mold, “Gurglin’ Gutz” Body Parts toys, and the obligatory rubber chicken (surprisingly effective against intractable technical problems in your planetarium). Alas, the body organ lapel pins have still not returned, as far as I can tell.

To get a catalog, contact as given above, or call 1-800-231-6000 for ordering, 1-888-235-6472 for customer service, or fax to 1-847-674-0211.

And on that note, to end a particularly long and busy installment, let me wish one and all a happy solstice, with hopes for the best of new years just ahead. And remember, until next time .... what’s new? ☆

Cumulative Index

A cumulative index to all articles that have appeared in the Planetarian from the first issue through the present is available on-line at the Planetarian web site at:

http://www.GriffithObs.org/IPSPlanetarian.html
President's Message

Jim Manning
Taylor Planetarium
Museum of the Rockies
Montana State University
Bozeman, Montana 59717
USA

Greetings!

In our hectic planetarium lives, it's good to stop occasionally and take stock of things—to remind ourselves of why we do what we do, how much we do, and to count the small successes which make it all worthwhile. Such an occasion happened for me during the busy second week of October.

That was the week we were visited by the "Mars Lady."

The furor over the Mars meteorite and its tantalizing contents wasn't two months old when we learned that one of our university's professors was bringing Kathie Thomas-Keprta to the campus. Thomas-Keprta, a senior research scientist for Lockheed Martin, had worked on the meteorite, performing the transmission electron microscopy which had produced the thin-section images of carbonate deposits and iron-rich mineral grains so suspicious of life processes. She also helped with the scanning electron microscopy which had produced pictures of those tiny worm-like forms. She was one of the presenters at the August 7 news conference where the science team discussed their findings as evidence of possible past life on Mars. And on October 8 she was going to be speaking to university classes here in Bozeman. Wouldn't we like to do something in the evening for the public? Talk about "no-brainers"...

We hastily scheduled a public talk for our museum auditorium, called the local news media, tossed press releases to the four winds, and muttered a quiet thank-you to the god of serendipity. You learn in this business, when manna falls into your lap from heaven, to take advantage.

When night fell on the 8th, we were ready for the talk—and armed to the teeth with context. First, we offered a special performance of an original planetarium program we called "How to Build a Planet," a show that—as luck would have it—was positively pregnant with connections. It presented the latest scientific theories on what it takes to fashion an earth—an ever-changing planet suitable for life—with comparisons to Venus and Mars. We even asked the right Martian questions: was it more earth-like in its youth, and could bacterial life have gotten a start? If so, might it still exist in some protected spot, or would only fossils remain? The program laid some groundwork and offered a bigger picture in which to place the claims being made for Mars.

Then, as the gratingly large crowd assembled in the auditorium, I was asked to offer some additional context in the form of prefatory remarks. For this, I selected some excerpts from the excellent NASA video on the Mars Global Surveyor and Mars Pathfinder missions. As the audience watched Global Surveyor aerobraking into a circular orbit and scanning the surface, as we watched Pathfinder "land," bouncing like a beach ball over the nighttime surface padded by its airbags, and watched "the next morning" as its little rover rolled off its perch on a deployed solar panel to putter about among the red rocks, I pointed out that while these craft wouldn't be looking for life, these missions and the studies of the Mars meteorite were all of a piece. All were ways to learn more about Mars, about our solar system, and thus to better understand our own earth and the possibilities of life beyond the earth, elsewhere in the universe.

Having warmed up the crowd, it was time for Kathie Thomas-Keprta. With video, slides, and clear, step-by-step commentary, she laid out the work that had been done and built her case for life-signs-in-a-rock: explaining why scientists were in agreement that the meteorite came from Mars, how it could have, how it was found ... recounting the procedures used in examining the specimen ... introducing the findings—the carbonate deposits, the hydrocarbons, the concentrations of iron-rich mineral grains, the images of the little wormy bits themselves, explaining their significance ... listing the reasons why her team considered the results—taken all together—to be evidence of past life on Mars ... and citing evidence and images for recent claims of similarly-sized "nannobacteria" on earth.

It was a masterful demonstration of the scientific process at work.

And when she was done, then came the flood of questions—good questions. Questions like how do you know the meteorite came from Mars based on the Viking results, since the Vikings examined Mars as it is today, not as it was when the rock was on Mars? What are the main concerns of your skeptics, and what further experiments are planned to address those concerns?

And when the questions were done and the crowd slowly dispersed and the evening was over, it was easy to breath a sigh of satisfaction. With little advance notice, we'd brought the cutting edge of science to Bozeman, Montana, offering a receptive audience perhaps a little better understanding of the world and universe about them, a little deeper glimpse of the process of science.

Business as usual, really, for a planetarian. But what a wonderful way to do it!

All that busy week, I thought about the night the "Mars lady" came, and how we in our own facility work and hustle and plot and connive and take advantage of opportunities and make our own when there aren't any, so we can do the things we do and carry the gospel of science and the universe to the masses.

I thought about "How to Build a Planet" which we offered that night, an original production made possible by getting a grant from our state's NASA-funded Space Grant Consortium, because we couldn't possibly budget the money for it ourselves... about how that program was actually designed to support and complement a new museum exhibit, because we've learned the importance of "fitting in," of supporting the exhibits and programs and mission and goals of our parent institution so that we're considered a core program and not just that eccentric Uncle Louie who lives up in the attic—"we don't know quite what to do with him, but he's family after all, so we just have to put up with the inconvenience"... because we've learned that to get support, you've got to give support, and adapt to your environment—while still doing good astronomy education...

I thought about the NASA video we presented on Mars Lady Night, about how we got it through our university physics department because we learned that our university was one of a small number with an arrangement with JPL to get Mars mission materials... and how the excerpts we used were also featured in our Current Sky/Current Events show, in which we apprise people about Hubble, Galileo, the coming Hale-Bopp, and the latest goings-on in space exploration and astronomy...

When I prepared that same week to have duplicates made of slides I shot of the September 26 lunar eclipse, I thought back to eclipse night and the horde of high school kids who came to our public observing session, watching as the Man-in-the-Moon rose at sunset over the eastern ridges already missing his right cheek, peeking at him through our telescopes, using sheets given to them by their teachers to sketch how the...
moon looked and how it changed as it mounted the sky and slid into the earth's shadow ... and I remembered the help we received that night from members of the local astronomy club, and how we'd been the catalyst to start that club several years back because we thought the area needed one and there were mutual benefits to be had ... and how we now provide a space for their monthly meetings, and in turn they assist us with things like star parties and special observing events ... When we premiered our new laser show on Friday of that week, with our brand new laser system, I thought back to how that system was paid for by a benevolent supporter to whom we said the right word at the right place at the right time, and who saved us just as our old system was on its last legs ... and how the mostly high school and college crowd which was enjoying it was a group we seldom saw in large numbers for our regular programs, and that maybe this would bring them back to see other programs ... and if not, at least we were able to offer them an experience they valued, while they provided precious revenue that could help keep us afloat ...

And when I struggled that week with next year's budget and the directive to squeeze one more drop of blood out of our section of the proverbial turnip, I thought of how we worked and planned and bargained every budget-time to end up with enough money to keep the operation going one more year ...

And when I turned the corner on another birthday that very week, I thought about how I could no longer deny that I was now in my theoretical "peak earning years"—and how I was in absolutely no danger of becoming rich.

And you know what? I'll bet my week was not so different, really, from yours.

I think our story is probably, with a few changes of emphasis here and there, typical of most of us. And that (with a nod to Jack Horkheimer) we've all learned to be "star hustlers," working to take advantage of the resources and opportunities we have, scratching every day to enlighten, to educate, to inspire, to survive so we can live to enlighten another day.

And why do we do it? It's not for the money (although Don Hall has been heard to say "I'm in it for the bucks"—with his tongue drilling a hole through his cheek). It's not for the fame (although we get our fifteen minutes on the local airwaves every time there's something to explain in the heavens). So what's left?

Love.

Recently, I've been rereading Tolkien—of whom I'm a big fan, as I think are many planetarians. His stirring tales of a mythical "Middle-Earth" read like the ancient sagas of northern Europe, written in prose that reads like poetry. His stories are filled with magic and strife and noble deeds and a liberal lacing of sky references and astronomical motifs. Of the strange and wonderful races which populate his tales, most everyone's favorite is the Hobbits, those diminutive, furry-footed Everymen who give extraordinary events a common touch. Personally, I have a soft spot for his Ents, those old and loquacious tree herders (I can relate to anyone who takes time to say "sornethulg"). But of all Tolkien's creatures, I think I'm most partial to his Elves—because they love the sky.

Now Tolkien's Elves are not pointy-toed pixies who fix shoes, bake make toys at the North Pole. His are tall and noble beings, predating the race who awakened in the mystical deeps of time beside a glassy lake in a twilight world before the crafting of the sun or the rising of the moon.
And when they awakened, the first thing they saw was the stars, spread in a glittering mantle across the sky. And so Tolkien gave his ancient race of Elves an ancient name—the Eldar, which he said meant “People of the Stars.” And ever after, they had a love for the stars, for song, for lore. Add a laser pointer and a zoom projector (maybe computer automation and video for the really technical), and you could almost call them planetarians. Maybe that's why I like them so much.

I still carry that striking literary image—of beings awakening to the stars by a glassy lake, with a love of those shining lights kindled in their breasts—perhaps because I see it as an analogy for people like us. Sometime, somewhere, when we were much younger, we too awakened to the stars. They caught our imagination, we fell in love with the universe, we carried that passion into our schooling, and by some circuitous route, we ended up being lovers of stars, song, lore—laser pointers, zoom projectors, automation, video, and the rest. We ended up being planetarians. And with our passions and tools, now we strive to awaken others to the stars.

So why do we do what we do? I think it's for love. For the intangible rewards that come from enlightening others. For the satisfaction we get from putting about in the universe in a way that we enjoy. Because we really can make a difference—in small but important ways, one audience, one person, one glimmer of understanding at a time.

As I've said before, but will say again, because it's good to remember it from time to time: we do important work. We keep the cosmic link; we temper the absolute truths of the universe with the warmth of human perspective. We offer people knowledge and understanding and a sense of place on a fragile planet in a universe far bigger than ourselves. And it matters.

Keep the faith ...

**Report from Osaka**

*Konnichi-wa!* IPS ’96 is now history, and I think it will go down in the annals of IPS as one of our truly memorable meetings. And it seems particularly fitting that our first conference in Asia should be hosted by colleagues from Japan, whose more than 300 planetarium facilities rank it second in the world in sheer numbers of domes.

**The Pre-Conference Tour.** For early arrivals, it was ancient Japan that beckoned in the temples and shrines of the old imperial capitals of Kyoto and Nara.

On July 11, the international group of pre-conference met old friends and new while touring some of the ancient landmarks of Kyoto: the tranquil mountainside gardens of Kiyomizu Temple founded in the year 798, offering a panoramic view of the city and a chance to improve our odds by drinking from a spring whose waters are said to insure a long and healthy life ... squeaking stocking-foot over the “Nightingale floors” and past the painted and carved paneling of Nijo-jo—Nijo Castle—the 400-year-old Shogun’s residence, with its sculpted gardens, massive stone walls, and surrounding moat ... relishing the peaceful setting of Kinkaku-ji, the restored Golden Pavilion, overlaid with gold leaf reflected in the quiet waters of its pine-sheltered lagoon.

On the 12th, we toured Horyuji Temple with its five-story pagoda, the oldest wooden structure in the world built in the year 607 ... We marvelled at the size of Todaiji, the temple of the Great Buddha and the largest wooden structure in the world, and made donations to its upkeep by purchasing roof tiles on which we could brush in black...
Some of the Osaka Science Museum staff.

ink our names, addresses, and wishes for the future ... We walked the quiet, tree-lined paths of the revered Kasuga Shrine, a Shinto complex, whose countless stone lanterns bordering the walks are lit once a year. We were fortunate to witness a Shinto ceremony at the shrine itself, and obtained our fortunes and tied them to the branches of trees in traditional fashion ... We strolled through the intervening Deer Park, whose antlered denizens quickly became our friends if we happened to buy “deer cookies” which smelled good enough to eat ourselves ... But there was no danger of going hungry, for we were treated to delightful Japanese meals, exquisitely prepared and presented and offering a remarkable spectrum of tastes and textures ...  

The pre-conference tour was a wonderful introduction to the Japan of old, even as we prepared to experience the Japan of today in the conference itself.

The Conference. Official business began for the first officially bilingual IPS conference on July 13 at the International House in downtown Osaka.

At the Opening Ceremony, we were welcomed by Mr. Takafumi Isomura, the honorable mayor of Osaka; Dr. Tadao Nakano, the director of the host facility, the Science Museum of Osaka, and chair of the Organizing Committee; and yours truly, who did his best to offer both welcome and thanks in his very poor Japanese.

More than 300 delegates were in attendance from some 30 countries, making it the most international IPS conference ever, with simultaneous or consecutive translation between Japanese and English throughout.

During the four days to follow, those delegates had an opportunity to hear more than 60 paper presentations and eight workshops on new and changing facilities, planetarium technology, show production, education techniques and lessons, computer and Internet utilization, exhibits, telescope systems, and star lore, made by presenters from 15 different countries. They listened to interesting talks by Dr. Takeo Kosugi on solar coronal studies made by the Yohkoh and SOLAR-B satellites; by Dr. Norio Kaifu discussing the new generation of earth-based telescopes including the Subaru Project; and by Nobel laureate Dr. Kenichi Fukui on his life and motivations in studying the natural world.

Of especially notable interest was the “Asia Forum,” in which representatives from China, Hong Kong, Saudi Arabia, Singapore, Sri Lanka, Thailand, Vietnam, and Japan offered remarks on the status of astronomy education in their countries and recounted examples of astronomical folk tales.

During the IPS Business Meeting on the 13th, we heard brief reports from representatives of our 18 affiliate organizations, who related items and activities of special note and demonstrated a wealth of planetarium activity going on around the world. We announced the selection of the Planetarium de Montreal, Montreal, Quebec, Canada as host for the 2000 conference, announced IPS officer candidates and took additional nominations from the floor before closing nominations for the fall election, presented the Treasurer’s report and highlights of Council actions from our meeting on the 10th, and heard from Undine Concannon, head of the London Planetarium, who presented a report on preparations for IPS ’98. (See Council Meeting highlights below for details.)

On the 14th, the conference took an excursion to the pleasant Sakuya Konohana Kan, the Great Conservatory, in a nearby suburb of Osaka, offering strolls through exotic indoor landscapes of trees and flowers.
Then we headed to the Moriguchi Lifelong Learning and Information Center with its tilted-dome planetarium featuring a Goto Helios projector, where we saw a big-screen film and experienced an innovative program called "Tanabata 2050." The program was a science fiction love story based on Japan's Tanabata festival celebrated every July, commemorating the celebrated tale of how once a year, the shepherd and weaver (Altair and Vega) cross the barrier of the Milky Way and meet together in the sky. The program cleverly combined live-action actors on film with slide elements to tell the story.

On the 16th, we visited the host Science Museum of Osaka, built in 1987 and offering four floors of exhibitions, including hands-on and interactive displays and many exhibits on astronomy and energy. The museum includes a planetarium with a 26.5-meter (87-foot) tilted dome and more than 300 seats featuring the Minolta Infinium Alpha projector. There we saw a program on Neptune including Voyager studies and the latest from Hubble, witnessed a demonstration of the new Zeiss fiber optics projection technology, participated in a workshop on performing class lessons in the planetarium, and were treated to some striking time-lapse film footage of Comet Hyakutake with the Astrovision system.

On the final night of the conference, our hosts threw a marvelous farewell party at the Miyako Hotel, complete with tables laden with Japanese delicacies and a troupe of Japanese drummers. Certificates were presented by Phylis Pittluga, Awards Committee Chair, to the newest crop of IPS fellows, and the prestigious IPS Service Award was presented to Shoichi Itoh and to Dennis Simopoulos. Dr. Nakano, Mr. Konishi of Minolta Planetarium Company, and Mr. Goto of Goto Optical Manufacturing Company all made gracious speeches and I offered in turn some words of thanks and appreciation on the part of IPS to our excellent hosts and sponsors.

After four short days the official business of the conference was concluded, but it planted the seeds of new relationships between colleagues from around the world which I hope will continue to grow and bear fruit in years to come.

The Post-Conference Tour. But wait—there's more! For several days following the official conference, a large number of conferences extended their time together with a post-conference trip that took us to some of the other premier planetarium and astronomical sites in Japan.

On the morning of the 17th, the group departed from Osaka by shinkansen—"bullet train"—for the Toyohashi headquarters of Minolta Planetarium company. There in the test dome we saw the new Minolta Infinium starfield which stood up beautifully even to binocular scrutiny, and witnessed a remarkable collaboration of technologies in the program "Powers of the Universe" produced by Phil Groce. The program used a Minolta Infinium projector and an Evans & Sutherland Digistar II (together referred to as "GeminiStar") together with AudioVisual Imagineering's Omniscan laser projection system and Sky-Skan's Spice automation system (with lots of video) to tell a tale of our search for knowledge in the universe.

Then we traveled by bus to the Nagoya City Science Museum—which houses a large Zeiss planetarium facility—for one of the best parties of the trip. After an official welcome, our kind hosts in Nagoya gave us tours of their modern exhibits on astronomy, life sciences, and technology—followed by one of the most extraordinary planetarium experiences I've ever had. We were special guests at Nagoya's annual cosmic concert—a two hour affair with intermission based on Fred Hoyle's story "The Black Cloud." The concert featured a visualized narrative of the story interspersed with recorded music with full effects, live performances on the fu qin, or Chinese violin, a presentation of the current sky, a lecture on the interstellar medium, and a finale that included lasers and slewing video. Wonderful sensory overload!

That was followed by an exceptional rooftop buffet feast punctuated by excellent views of the planet Jupiter through the museum's telescopes.

On the 18th we traveled by train and bus to tour the Nobeyama Radio Observatory in the scenic Japanese Alps, where the large 45-meter dish and arrays of smaller radio telescopes study the molecules of interstellar clouds. That evening, we were guests at the Yatsugatake House Nature House for Youth, where Japanese youngsters go to learn about nature and the sky, and where we had a star party using the center's Goto 20-cm Coude-focus telescopes to view a variety of objects, including the first sight for many of us of Comet Hale-Bopp.

On July 19, we continued on to the Tokyo suburb of Fuchu for a tour of the headquarters of Goto Optical Manufacturing Company. There we saw the new Helios starfield and the super-bright field of the SuperHelios sporting what seemed like several million stars in a stunning visual effect. We also viewed Goto's 70mm film on the total solar eclipse of 1991, and received an impressive demonstration of the new "Virtuarium" system, in which four video projectors using silicon graphics technology cast seamless images of three-dimensional data bases on Goto's test dome. We wandered among the planets of the solar system, skied with a purple punk Humpty Dumpy down a wintry slope, flew with a jet fighter through downtown San Diego, California, and drove about a three-dimensional town.

The post-conference tour concluded in Tokyo, where the group divided to pursue several options. Some of us visited the Science Technology Museum near the Imperial Palace, where we participated in demonstrations of a silicon graphics real-time computer projection system used for interactive education. Phylis Pittluga chose the circumstances of a galactic encounter, and we watched as two island universes ripped each other apart as a result. And I volunteered my face in a demonstration of what happens when you look at something with a black hole between you and the object. (Personally, I think it was an improvement in my appearance.)

And if the trip itself hadn't already accomplished it, we firmly cemented our newfound friendships at a final, wild saki party in the heart of Tokyo, where we made our farewells before starting the long journeys home from a truly singular IPS conference experience.

A Word of Thanks. Throughout the conference, the hospitality and organization of our hosts was amazing—from the hard-working staff of the museum and the Secretariat and the army of efficient translators and guides, to box lunches too pretty to eat and sumptuous buffet feasts, to the touches of culture in the tea ceremony experiences, the chance to write wishes to hang on Tanabata trees, and the lively sessions in the karaoke bars, partying with new Japanese acquaintances.

On behalf of IPS, I'd like to sincerely thank our hosts, the City of Osaka and the Science Museum of Osaka; Mr. Takafulmi Isomura, mayor of Osaka, Dr. Tadao Nakano, Science Museum director and conference chair, and the members of the Osaka Organizing Committee; Mr. Shun-ichi Emura, Dr. Ken-ichi Me with a black hole in my face in Tokyo.

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Kato, Mr. Singo Kawakami, and all the members of the Science Museum staff; Ms. Noriko Hirose and her staff at the IPS Secretariat.

Sincere thanks also to the numerous official Japanese sponsors of the conference, and to the financial sponsors both Japanese and international, who numbered more than 40 and whose generous contributions made the conference both first-rate and astonishingly affordable for the participants.

Special thanks as well to Mr. Masahiro Konishi of Minolta Planetarium Company and his staff; to Mr. Ryuichi Goto of Goto Optical Manufacturing Company and his staff; to Dr. Keiji Higuchi, director of the Nagoya City Museum, to Ms. Masako Kitahara, planetarium director there, and their staff; and to the staffs of the Moriguchi Planetarium, the Yatsugatake Center, and the Nobeyama Radio Observatory, for hosting us at their facilities along the way.

And finally, thanks to all of the conference participants, without whose presence and contributions the conference could not have been the great success that it was.

If one of the goals of IPS ’96 was to make new connections and to build bridges of friendship and communication between countries and continents, then the parting of new friends at meeting’s end revealed important steps taken on our journey to become a truly world community of planetarians.

Arigato gozaimashita; domo go-shinsetsu ni.

The IPS Council Meeting

On July 10, prior to the start of the conference, the IPS Council convened its annual meeting, with follow-up sessions on July 16. Special thanks to all of the representatives who attended and made it such a busy and productive gathering. Watch for complete minutes of the meeting next issue; in the meantime, I offer a few highlights of Council business.

Concerning affiliations: Council approved the affiliation of the Canadian Council of Science Centers (CCSC) as the new IPS Canadian affiliate, replacing the Planetarium Association of Canada which has been incorporated into the CCSC.

Concerning committees: Steve Mitch’s Elections Committee report presented the slate of candidates for the fall election. (Additional names were placed in nomination during the General Business meeting.)

Awards Committee Chair Phyllis Pitluga announced 24 new IPS fellows and two recipients of the IPS Service Award (Shoichi Itoh and Dennis Simopoulos). The committee was charged to reexamine the awards criteria for fellowship and to present a proposal for next year which would aim criteria more toward achievement, accomplishment, and service.

History Committee Chair John Hare asked members to forward any archival material to him, and announced that the committee would make a proposal next year for documenting the history of the planetarium profession.

Martin Ratcliffe’s Outreach Committee report recounted recent efforts to forge closer ties with the IAU and other organizations, and encouraged members to submit names of astronomy experts for inclusion in the “Astronomy Link” program.

Ken Wilson, Planetarium Development Group Chair, is still seeking new committee members to work on a more comprehensive guidebook.

Jeanne Bishop, chair of the Consumer Affairs/Astrology Committee, continues to inform consumers about the IAU and other organizations, and encouraged members to submit names of astronomy experts for inclusion in the “Astronomy Link” program.

Portable Planetarium Committee Chair Sue Reynolds reported on the first European Meeting for Itinerant and Small Planetaria in Italy, and discussed the printing and distribution of educational materials and plans for an IPS publication.

The Script Contest Committee is being revived for the upcoming renewal of the Eugenides Foundation script contest, with Alan Davenport as chair; he will review the contest guidelines and develop a release form for publication of winning scripts.

The Packets for New Planetariums subcommittee chaired by Donna Pierce had its name changed to “IPS Information Packets.” Johan Gilzenbergs will chair a new committee which will look into developing partnerships between planetariums to provide mutual assistance and support. The following ad hoc committees were formally dissolved, due to lack of activity and interest: Public Relations, Exchange of Communication and Personnel, Curriculum Projects, Script Bank, Planetariums and Science Crisis.

Concerning amendments: Council reviewed and approved the three By-laws amendments for the fall ballot; two were “housekeeping” measures, the third would eliminate the little-used honorary membership. Several housekeeping amendments to the Standing Rules were approved, including reconciling the Standing Committees section to match the By-laws and list all standing committees, and adding an appendix of active ad hoc committees.

Concerning the IPS Home Page: Alan Gould gave Council a tour of the IPS Home Page via Internet link. Council approved its going on-line following several more additions and changes. (The Web site is now online.)

Concerning IPS 2000: as already mentioned, Council voted to accept the invitation of Planetarium de Montreal in Canada to host IPS 2000, with thanks to all of the sites making invitations.

Concerning membership policies: Council...
voted to change annual membership to be effective from the nearest quarter-year rather than January 1 - December 31, and agreed that new members will receive the current copy of the IPS Directory regardless of the date of membership.

Concerning audiovisuals: Hubble slide releases are now being sent to affiliates through designated contacts (affiliate representatives) for distribution. Additional visual distribution possibilities are being explored, including video possibilities, and European members will investigate potential sources of materials in Europe. Council agreed that duplication and distribution would be best handled through the affiliates rather than through a centralized effort by IPS.

Council approved the formation of a committee proposed by Jeff Bowen to investigate the development of a media package for use by planetariums, to include video, print, and other materials. Bowen was designated chair of the committee.

Concerning publications: Publications Committee Chair Undine Concannon indicated that inserts on upcoming conferences were ready for insertion into copies of the IPS membership brochure. The committee will work with the Language Committee to consider additional languages into which the brochure might be translated.

The Special Effects Sourcebook is undergoing revision and should be ready to publish by year's end.

Council discussed procedures for soliciting and checking the accuracy of vendor and resource listings for the new IPS resource guide, to be an expanded version of the GLPA guide with international listings. Publication is scheduled for sometime next year.

Council approved a proposal by Sue Reynolds to develop a draft of a new publication tentatively called the Portable Planetarium Resource Guide.

Council voted to forgo a 1996 addendum to the IPS Directory and to incorporate all updates into the 1997 directory to be published in the first quarter of 1997.

Council also voted to establish a European publications repository in addition to the one in the U.S., and to consider possibilities for an Asian repository as well.

Concerning IPS '98: conference host Undine Concannon presented a status report on the upcoming London meeting. The fourteenth IPS conference is provisionally scheduled for June 29-July 2, with Council Meeting on June 28 and the optional post-conference tour running July 3-7. Tentative costs estimates include 250-300 Pounds ($375-400 U.S.) for the conference registration fee; 90-125 Pounds ($135-188 U.S.) per room per night for accommodations (half that if two people share a room), with university accommodations available for approximately 18-22 Pounds ($27-33 U.S.) per person per night. The cost for the post-conference tour will be in the range of 500-550 Pounds ($750-825 U.S.)

Tentative conference plans include visits to Greenwich and the Old Royal Observatory and the Stonehenge and Avebury megalithic sites. The post-conference tour will include visits to the Jodrell Bank radio telescope and Science Center, Belfast and the Armagh Planetarium, Dublin, Newgrange or Castletown House, and the Rosse Telescope at Birr.

Concerning the 1997 Council Meeting: Thomas Kraupe indicated that he was considering several possibilities in Europe. (He has since announced that the meeting will

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be held in Strasbourg, France on June 23, just prior to the TULIE Meeting in the same city.)
Again, watch next issue for a full report.

The IPS Home Page

As mentioned in the meeting notes above, the IPS Home Page on the World Wide Web is now operational. The address is: http://sunsite.unc.edu/ips/, and it's definitely worth checking out!

Alan Gould has set up the initial directory page as a mini-planetarium console. Activate the appropriate control and you can find general information on the Society, a list of officers and affiliates and standing committee chairs, copies of the By-laws and Standing Rules, a “Planetarian's Calendar” prepared by Alan Gould, a listing of planetarium web sites courtesy of Jenny Pon, a listing of planetarium-related vendors maintained by Don Knapp, a site for IPS conference information, and a link to John Mosley's site for the Planetarian. Additional console controls lead to IPS history, publications, committees, and job listings—areas which will be fleshed out in the coming months.

Special thanks to Alan Gould for his efforts in setting up the site, and to Home Page Subcommittee Chair Tom Hocking and committee member Thomas Kraupe for their good work as well. The Home Page will be a source of useful information and links which will only continue to grow. Do have a peek, and address any correspondence concerning same to: <ips@sunsite.unc.edu>.

Committee News

Rick Greenawald of the Herrett Museum in Twin Falls, Idaho USA has accepted the Chair of the Technology Committee. The purpose of the committee is to monitor and investigate existing and emerging technologies that have or may have an impact on planetariums, and to communicate on these matters periodically to the membership. The committee can also serve as a more focused resource, perhaps, for members seeking information on particular technologies.

Congratulations and thanks, Rick. And if anyone has expertise or experience in a particular area of technology and would like to participate in the committee's effort, please contact Rick in Twin Falls.

The chair of the Language Committee has not yet been filled as I write, but may be as you read. The function of this committee is to explore the possibilities of translation at conferences and publishing relevant articles and brochures in languages in addition to English, and to consider other language-related issues. If you might be interested in serving on the committee, please let me know.

References

Recently I received a copy of “An Invisible Infrastructure: Institutions of Informal Science Education,” from the Association of Science and Technology Centers (ASTC). It's the published results of a survey commissioned by ASTC to quantify the role of informal science education institutions (science centers, nature centers, natural history museums, zoos, aquariums, arboretums, botanical gardens, children's museums—and planetariums) in supporting the teaching of science in U.S. schools.

The survey's findings seem to substantiate what we've long known—that such institutions significantly support formal science teaching, and in fact form a little-recognized part of the “infrastructure” for science education.

To quote just a few figures: there are an estimated 1,500 informal science education facilities in the U.S.—one for every 50 schools and 1,000 teachers. (Only “stand-alone” planetariums seem to be counted in this figure, and not those that are already included as parts of larger informal science education institutions; I suspect that school-related planetariums do not figure in the survey at all.) Every year, about 150,000 U.S. teachers of science—10% of the total—are engaged in education events (such as workshops) that are conducted by informal science education institutions.

Three-quarters of these institutions have programs serving the local schools, and 80% of the funding for them comes from local sources. Some 90% of these programs focus on elementary grades. Some 30% of these institutions “heavily” serve students underrepresented in math and science—for the stand-alone planetarium contingent, the figure was 40%.

And of course, “relative to their potential for supporting high quality science education in the United States, these institutions are undersubsidized.”
Interesting figures to examine—and perhaps to have handy for reference. If you'd like to obtain a copy of the report and learn more, contact the ASTC Publications Department, 1025 Vermont Avenue N.W., Washington, D.C. 20005, telephone 202-783-7200, fax 202-783-7207. The report comes in two volumes. Volume 1 contains the findings of the survey and costs $18 U.S. ($13 for ASTC members). Volume 2 contains the survey form and detailed charts and graphs of the data gathered. (I'm not certain of the price because there seems to be an error in my information on this one; but it's bigger than Volume 1 and so I suspect it costs more.)

In addition, a brief “Executive Summary” is free upon request in limited numbers, but ASTC plans to have this available on its web site at <http://www.astc.org>. You might check.

The survey was conducted only for U.S. institutions. It would be interesting to know if similar sorts of surveys have been conducted in other countries. International members, can you advise?

Regarding another handy reference, I've recently spoken with Bob Havlen of the Astronomical Society of the Pacific (ASP) about its excellent publication Astronomy Education: Current Developments, Future Coordination. This is the proceedings of the ASP Education Symposium held in College Park, Maryland USA in June of 1995, which was attended by a wide array of astronomy educators from professional astronomers to elementary school teachers, with many planetarians present. The publication offers some excellent insights into the current state of astronomy education as well as examples of innovative efforts to improve it and ideas for coordinating those efforts.

Bob has indicated that ASP would be pleased to offer IPS members a 25% discount on the $40 U.S. publication, so if you'd like to have one, you can save $10 by citing your current IPS membership.

I highly recommend this book as a good reference on where astronomy education is and where it needs to be going. While a mostly American perspective is present, there are international perspectives offered as well, and there is much of value for anyone looking for information, opinions, and ideas on the subject. Consider it—and contact the Astronomical Society of the Pacific, 390 Ashton Avenue, San Francisco, California 94112 USA for ordering information.

Ongoing Projects

There are a number of projects continuing to move forward, designed to offer some useful services and practical benefits of IPS membership. Affiliates have been developing duplication and distribution plans for the Hubble Space Telescope slides and accompanying Information sheets which they are now receiving from the Space Telescope Science Institute in Baltimore, Maryland USA. Contact your affiliate officers or coordinators as necessary to acquaint yourself with your affiliate's plans.

We continue to explore additional materials distribution possibilities, including video and materials from other agencies, both in the U.S. and abroad.

Remember also to send your subscription information to Secretary Lee Ann Henning if you would like to take advantage of subscription discounts to Sky & Telescope or Astronomy magazine. You can save approximately $10 U.S. on your subscription to either as a result of your membership in IPS, for either U.S. or foreign subscriptions. Once we have the minimum number required, the savings will commence!

Undine Concannon reports that a British-based magazine called Astronomy Now will also offer a discount of 3 Pounds (about $4.50 U.S.) on subscriptions for IPS members, and no minimum number of applicants is required. To take advantage of the offer, contact Chris Courtier at Astronomy Now, P.O. Box 175, Tonbridge, Kent TN10 4ZY, telephone 01903 266165, fax 01732 356230. Thanks for the tip, Undine!

Our “Astronomy Link” effort to publish in the Planetarian a list of astronomy experts willing to consult with us in their areas of expertise awaits only a critical mass of names. Once a reasonable minimum number has been gathered, the first publication of the list will occur.

So if you have a local expert or two who might be willing to add his or her name to our list, please send those names along with area(s) of expertise and the particulars on how to contact to Outreach Committee Chair Martin Ratcliffe or to me. When we get enough, look for publication—early next year, perhaps.

Conference 2002

Believe it or not, it's not too early to start thinking about the first IPS conference of the new millennium! Invitations to host the 2002 conference must be received in time to be presented at next year's Council meeting, scheduled for June 23 in Strasbourg, France. The selection will be made at the Council meeting in London, hardly a year and a half away.

If your facility would like to consider making a bid for 2002, please contact either me or Thomas Kraupe for information on procedures.

Looking Back ...

This is my last President's Message as my term as IPS President comes to a close. On the stroke of midnight on December 31, I turn back into a pumpkin, and Thomas Kraupe will capably assume the mantle of leadership of our Society.

It's amazing to me how quickly the last two busy years have flown by. It seems you just get rolling, and it's already time to leave. You never seem to accomplish all that you would have liked to, but if there have been some small accomplishments during the past few years, it's because many people have worked very hard for a long time to see them realized or begun.

Our Society's membership has perhaps never been larger than it is right now, and it has never been more international, with individual and institutional members from some 35 countries. We have recently held our first bilingual conference and our first ever in Asia; in a year and a half, we meet again in Europe, and on the eve of the new millennium we return to North America, to Montreal. While there has been a pause in new regional affiliations most recently, we have planted seeds and encouraged inquiries wherever we could; our Canadian colleagues are recently revitalized in a new affiliated organization, and next year we may very likely see our first affiliate application from the Southern Hemisphere.

Slowly, steadily, we are becoming what we were meant to be: a true world community of planetarium professionals, sharing the best of ourselves and our experience for the mutual benefit of all.

We have tried hard to make connections not only with each other, but with other organizations. We now have an official representative on the International Astronomical Union's Commission 46 (The Teaching of Astronomy) and made an address at that group's London symposium just this year—where we also discovered planetarium colleagues with whom we'd not connected before. We've officially participated in the Astronomical Society of the Pacific's Education Symposium last year, and have worked to strengthen ties with that organization. Individual initiatives on behalf of the planetarium community have taken us to gatherings of the Association of Science & Technology Centers and the American Astronomical Association; we've presented a colloquium at the Space Telescope Science Institute, and some of our European members have been influential organizers in the European Association for Astronomy Education. With our new Outreach Committee, we will continue to seek these important links. And we have established an IPS Home
Page on the World Wide Web, where we can make electronic connections and can provide important information about who we are and what we do.

Nor have we not forgotten the importance of practical organization benefits which can help us in our daily work. The *Planetary* continues to be a source of vital communication and ideas—and you can set your watch by it. The IPS Directory continues to grow in listings and has been reestablished as a regular publication with a newly established data base—it's an address book and telephone directory for our community. The publishing arm of our Society continues to hum: the reissue of our updated *Special Effects Sourcebook* is imminent, next year will see the publishing of an IPS resource directory with international listings, and a portable planetarium publication is now in the works.

And if I were to leave you with a final thought, it would be what I've said all along: that we do good work, important work ... that it matters ... that we can make a difference.

We've strived to seek out useful things to do and offer, from the inclusion of the ASP's "The Universe in the Classroom," now included with your journal issue, to discounts like that on the ASP's astronomy education symposium proceedings and on astronomy magazine subscriptions, to materials distribution like that of the Hubble Space Telescope slides, to new committee efforts to keep us up-to-date on technological trends, to seek ways to encourage mutually beneficial planetarium partnerships, to investigate the possibilities of developing a media package to help us in our promotional efforts.

There are many people to thank for these and other efforts of our organization. Look on the editorial page and the IPS listings in the *Planetary*, or the June issue's committee status report, or the minutes of our meetings, or our conference reports, and you will see many of their names. The next time you see these people, thank them for their service and dedication to our Society and our profession.

At the end of my term, I find myself in debt to an awfully lot of people, and some special thank-you's are very much in order: to my fellow officers Thomas Kraupe, Lee Ann Hennig and Keith Johnson and to Past-President Bill Gutsch, whose help and advice and support has been crucial and unflagging. IPS will be in very good hands indeed with Thomas, who will bring wonderful talents to the role of president. Lee Ann and Keith have done a superb job in managing the details of the Society with efficiency and grace. And Bill has been an amazingly active and helpful past-president. I doubt that anyone will ever know just how hard these people have worked or how much they have done on behalf of the membership and the profession. I owe them a debt of gratitude I shall never be able to repay. Congratulations to Keith and Bill as they retire from their positions after long and faithful service, and best wishes to the new team of officers who begin their journeys on January 1.

Special thanks also to the Council members with which I've been privileged to work, and to all of the committee chairs (Undine Concannon, Steve Mitch, Phyllis Pitluga, Tadao Nakano, Jeanne Bishop, John Hare, Ken Wilson, Steve Fentress, Sue Reynolds, Martin Ratcliffe, Donna Pierce, Alan Davenport, Rick Greenawald, Johan Gijsenbergs, Jeff Bowen—apologies to anyone I've missed) and to their committee members.

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for the "Cosmic Update" show and we will continue to caption each replacement taped show. We hope to be able to offer captioning for live shows in the future when voice recognition software allows for a higher accuracy rate. We are also captioning our school programs.

Response to the system has been extremely positive. Each of the four captioning stations can serve up to three people, allowing up to 12 visitors per show to watch captions. We plan to increase the number of captioning stations upon further outside funding from donors.

With the VFD captioning system, assistive listening devices, and scheduled sign-language interpretation, we are able to reach more visitors with hearing impairments. We hope that other planetariums will consider including these kinds of accommodations to make their part of the universe more accessible to underserved visitors.

References


Design Continuum, 1220 Washington St., West Newton, MA 02165, (617) 969-5400

The CPB/WGBH National Center for Accessible Media, 125 Western Avenue, Boston, MA 02134, (617) 492-9258 (Voice/TTY)
Jane's Corner

Jane Hastings
Thomas Jefferson Planetarium
4100 West Grace Street
Richmond, Virginia 23230

I sat down to lunch in the school cafeteria. Two men I never saw before were already there, eating lunch. One was the new security guard; I figured that out because he had a walkie-talkie and was wearing a navy blue tee-shirt that had the word "SECURITY" emblazoned on the front. The two men were talking about the results of a ball game from the previous evening. I introduced myself as the planetarium person to the new guard; he said "Hi", and then went on talking to his friend about the game. I ate, silently, feeling that the short exchange between us was probably all for that day, maybe for the rest of the year. It seemed obvious that we had nothing in common.

Later that day, the guard happened to turn a corner just as I came up a flight of stairs, so we ended up walking in the same direction. Just to be nice, I said, "I'm going to the planetarium. Want to take a look?" I often offer a curious newcomer a "look at the planetarium" if they come by. They usually come in, look around, say "this is nice" and then leave. Sometimes, if they linger for more than 10 seconds after entering, I offer to show them the stars. I have them sit down, make it dark, and show them the stars. They usually then say "this is nice" and leave.

He came in. He didn't say anything. He lingered for more than 10 seconds. I offered to show him the stars. He said, "OK".

Me: "Is that the Big Dipper?"

He: "Yes, but let me show you tonight's sky.

Me: I was fixing the machine earlier today so I have to make some adjustments to show you tonight's sky. It'll just take a minute.

He: "How do you know that's tonight's sky?"

Me: Not the first time I've gotten this question. His implication was: "How do you know what tonight's sky will look like, when we haven't had 'tonight' yet?" I wanted to say, simply: "because I've been doing this for 25 years. Trust me: this is tonight's sky." Instead, my "teacher" personality kicked in and I said:

"Well, you see that group of stars up there (used my pointer)? It makes a cross, see (point- er)? That cross is at the top of the sky tonight.

He: "The stars make lots of crosses. What's so special about that one?"

Me: "Well, you see that star in the cross? It's bright. Not all crosses have a bright star."

He: "Oh."

Me: "And now the Big Dipper is low in the sky, like it is tonight, see (pointer again)?"

He: "Oh."

I could see that he didn't see. I wasn't hitting the mark. We weren't communicating. I figured it was time for him to say, "This is nice, but I have to make my rounds. Thanks." In anticipation of that, I began to move toward the door.

Instead, he said, "I was in West Virginia this summer and I saw the stars. I stepped away from the house into the dark and looked at the sky. The friend I was visiting came out, found me away from the house, and said, 'you know why they call this place Bear Mountain, don't you?' I stepped back inside, fast."

We laughed at the imagined confrontation in the dark between man and bear. He continued, "When I saw those stars, I felt like I was in that movie... you know... Joe Volcano... when they were in that raft. I felt like I could reach out and touch those stars."

He then said, "Do you know that 50 years ago people laughed at Buck Rogers, Isaac Asimov and all those science fiction writers? Now look! We're in that space station."

He continued, "People on earth have got to realize that we got to quit fighting each other and take care of this fragile planet and go on out into space, to Mars. We went to the moon and then we quit. Something wrong with that."

Before I could agree he said, "You know why all those TV shows are about aliens? They're out there. My dad was a traveling salesman. He was chased by some fast-moving lights right above his car one night. He got up to 100 mph! You know, Carl Sagan says it's mathematically impossible for us to be the only life in the Universe."

He jumped to another topic: "And those dinosaurs were wiped out. What about that time when all those trees fell in Russia? A black hole or something hit the earth."

He added, "I tell my teen-age son: 'keep dreaming.' He laughs when I tell him that he or his son will be going into space."

And finally, he said, "When I was in the navy, I saw sunrises and sunsets like you can't imagine. And those stars! I'll never forget how they looked."

I didn't say much. (I couldn't get a word in edgewise!) I nodded, listened. I chastised myself for figuring that I would have nothing in common with a security guard, making his rounds. Nothing in common indeed. Only the same wonder about "out there" that everyone must feel when they look at the stars.

My job as a planetarian must surely include giving people an opportunity to think about the Universe with me: I must not forget how people feel about the stars.

Overheard:
- Planetarian Alan Gould hosted an "Observing an Eclipse of the Moon Through Telescopes" party at the Lawrence Hall of Science in Berkeley, Calif. Conditions for viewing were not good; the moon peaked in and out of clouds during its entry into the penumbra and totality. When it started to sprinkle, Alan declared that the moon had entered "umbrella" and that the eclipse party was over.
- At a recent planetarium conference, a planetarium manufacturer representative was beginning his presentation in the planetarium with a video. It began with a slowly rotating "black hole" that dominated the scene. But no sound! The representative shouted to the technician, "where's the audio?" As if on some unseen cue, almost every planetarian present began to make sucking sounds!
- At the same conference, another planetarium manufacturer showed a slide of stars. The slide hadn't been focused. Voice from the audience "Oh, that's a cluster of ring nebulas!"
- From National Education Association newsletter: "Michael stood by my desk, waiting for me to grade his math test. He studied the calendar on the bulletin board for awhile, then asked excitedly, 'Hey, are we getting a new moon?'"
- From Goehff, Chester, planetarian at Air and Space Museum, Washington, D.C.: The National Park Service at Sky Meadows was delighted at the public response to the Comet Watch Goehff arranged for Comet Hyakutake. They had 2000 people show up at $2.00 per car. They told Goehff: "Bring on the comet!" [We'll see if Comet Hale-Bopp can top this!]
- Speaking of Hale-Bopp: I'm getting questions already, of course. A person came up to me and said, "Hey, I heard about that asteroid that's coming the one named 'Uncle Bob.'"
- Tim Slater, planetarian from Pittsburg, Kansas, became involved in a project using state Eisenhower funds, part of which allowed teachers to purchase science equipment. Tim was delighted to be able to participate, because, as he said, "A visit to the planetarium is (usually) the only astronomy that teachers get."
- At a planetarium in the Middle Atlantic Planetarium Society region (Can't figure which one from my notes; sorry!) the school administration in the district does not want to keep operating its school planetarium, which opened in 1969. Reason? Being technologically sensitive, they do not want to keep equipment around which isn't up-to-date; after all, the planetarium has an ancient 1969 sky!
This is what the world's toughest audience had to say about America's first Minolta Infinium Planetarium:

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"Wow!"

A sky so real that you will believe. Background is a photograph of actual Infinium sky

Last July, Florida's Brevard Community College hosted the International Planetarium Society. Pictured above are some of the nearly 500 planetarians from around the world who gathered to exchange ideas and witness America's first Minolta Infinium Planetarium. The result was nothing less than dazzling. For more information about the Infinium and other model projectors, call your nearest Minolta representative today. After all, at Minolta we know that once you have seen our sky, you too will believe.
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