

President's Message

The old Chinese curse "may you live in interesting times" has struck again. I sincerely hope that the horrible events in New York, Pennsylvania, and D.C. have not touched too close to home for any of our SEPA family members. I haven't heard of any direct connections so far, thankfully. Although something this big is bound to have an effect on all our lives. Look for a few more thoughts I had about these events at the end of this article.

At the conference I was given a video tape made for the Paper Plate Astronomy program for use as a master by SEPA. This is a terrific workshop created by Chuck Bueter and GLPA. The tape describes the different paper plate astronomy crafts and how to conduct workshops for students. For now, if you would like a copy of this tape please contact me by phone so I can gauge the level of interest. I may then have you send a blank VHS tape to me and I will make a copy for you. If there are many requests, I may then ask SEPA to have a certain number of them copied for distribution on request.

One particular business item we have been working on over the last several weeks concerns the IPS conference in 2002. As many of you may know, the hosts for the scheduled IPS conference in Morelia, Mexico regrettably needed to withdraw their invitation. This put IPS in a very tight spot. They needed to scramble to find a new location and plan a full conference in about half the time normally allotted.

Naturally, Phil Groce saw an opportunity for SEPA to help out. Council and I agreed. Unfortunately there was not sufficient time to consult the SEPA membership. We needed to move fast. And so, with Council approval, I wrote a letter of support for the plan. Phil Groce and Carol Gikas (Executive Director of the Louisiana Arts and Science Center, which will be our host in June) put together an excellent proposal for IPS to consider holding their conference in Baton Rouge. This would mean that SEPA would be able to offer its membership the opportunity to attend not only a slightly (shortened) SEPA conference but an IPS conference as well. I felt that there would be many potential ben-

efits to this plan. It would save each of us some money and bring us more exposure to the international community, among other things.

Bids also came in from Wichita, Kansas and Louisville, Kentucky. Since staff of these two sites were also on IPS Council, President Martin Ratcliffe, and Treasurer and Membership Chair Shawn Laatsch both recused themselves from the selection process to avoid any appearance of impropriety. Unfortunately for us, voting awarded the conference to Wichita. I congratulate Martin and his facility for the successful bid. I look forward to attending the conference there in July, 2002.

This means that our SEPA conference will proceed as originally planned June 25-29 in Baton Rouge. I also received a nice letter from the Executive Director of the Louisiana Arts and Science Center commiserating about the loss of the conference to Wichita. It was worth the try, she wrote. Since extra planning went in to the potential IPS event, this should prove to be one of the best planned conferences ever.

Phil is now shifting gears to restructure the conference registration and line up vendor support, among many other things. Mailings should appear sometime in January. Phil has asked that hard copies and computer disk versions of all paper presentations be submitted in advance to be used later in *Southern Skies*. Many groups already do this, and I think it is a good idea. It will just take a little better planning and a bit more time on the keyboard for those potential presenters.

Speaking of upcoming conferences, Council is looking over proposals for the 2003 SEPA conference. Because time is short Council will discuss the proposals and make a decision. You should hear news about that in the next issue of *Southern Skies*.

On October 24, I submitted an IDEAS grant proposal for the money we need to proceed with the Galileo show project. In

David C. Maness
President
Peninsula Planetarium
Newport News, Virginia



order to fit the idea into their parameters for the grant, I needed to make it a bit more than simply a planetarium show.

I thought members of SEPA could contribute activities related to spacecraft missions to explore other planets. These would be based on a hypothetical mission to Jupiter. We would assemble these into a workbook to be distributed with the planetarium show. Recipients could then distribute the workbook to any underserved group in your area like Big Brothers/ Big Sisters.

We would also need to create a questionnaire to be completed by participants after completing the workbook. Planetarium staff would sponsor and advise those groups in completing the exercises. Upon submitting the questionnaire and final report to the sponsor planetarium, they could then receive passes to see the Galileo program in the theater.

The grant evaluation process will take several weeks. Unless the proposal is rejected out of hand in the first round of cuts, I don't expect to hear anything until the end of February at the earliest. If we are successful, I will then be calling on SEPA members to submit classroom activity ideas to be included in the workbook.

Wish us luck.

As I stated at the beginning of this article, I wrote down some thoughts about the events of September 11, 2001. As with the assassination of President Kennedy (for those of us old enough to remember) people will remember where they were when they heard about the barbaric acts that day. When I heard the news, I was on the road back to Virginia that Tuesday morning, after attending my niece's wedding. For the first few minutes, I had hoped that it was only a radio station prank, though in very poor taste. Unfortunately it was not.

As the events played out over my car radio, I drove in stunned silence past the beautiful scenery of Caneseeus Lake. At some point I heard that another plane had crashed into the Pentagon. I was heading south toward Harrisburg, Pennsylvania when I heard that a third plane had crashed near Pittsburgh. It was soon announced that all commercial airlines had been grounded by the FAA. I thought of the senseless, hateful, barbaric acts and the incredible loss of innocent lives.

Driving on, I occasionally looked up at the sky and wondered when the last

(continued on page 23)

IPS Report

Following the unfortunate decision to cancel the 2002 conference in Morelia, Mexico, IPS solicited bids and chose another site. A review board composed of Past Presidents Dale Smith, Thomas Kraupe, and Jim Manning along with President Elect Jon Elvert and Secretary Lee Ann Hennig evaluated bids and passed them to Council for consideration. Because President Martin Ratcliffe and Treasurer Shawn Laatsch were potential hosts, they removed themselves from the selection process to ensure a fair process. The three bids voted on by Council were as follows:

- Exploration Place, Wichita, Kansas
- Gheens Science Hall & Planetarium, Louisville, Kentucky
- Louisiana Arts & Science Center, Baton Rouge, Louisiana

The unique nature of this conference and the demands of planning on such

short notice dictated requirements and standards essential to the success of hosting the 2002 Conference on which Council was requested to focus. The bids from each of the three sites were well presented, followed the guidelines set by IPS By Laws and Standing Rules, and met the standards addressed by the special nature of this Conference Vote.

Based on the vote taken by the IPS Council, the host for IPS 2002 will be the Exploration Place, Wichita, Kansas. The dates for the conference will be July 28 - August 1, 2002.

A conference Web site has been set up at <<http://www.exploration.org/ips2002>>. As of mid October there was basic information about the dates of the conference and links to all airline Web pages for you to make initial inquiries about travel routes. A provisional program is also on line. Registration information will be ready by the end of this year.

Thank You

Thank you very much, both long time and new SEPA colleagues, for responding to my plea for help in the last issue. I'm very pleased to be able to announce that Southern Skies has a two new associate editors helping to keep your journal filled with articles and features that cover a wide range of pertinent topics.

Robert Little has assumed the position of AstroVideo Review associate editor. He is a new SEPA member who works at the Aldrin Planetarium in West Palm Beach, Florida with Leslie Bochenski. You can find Robert's review of a NOVA video entitled The Doomsday Asteroid on page five.

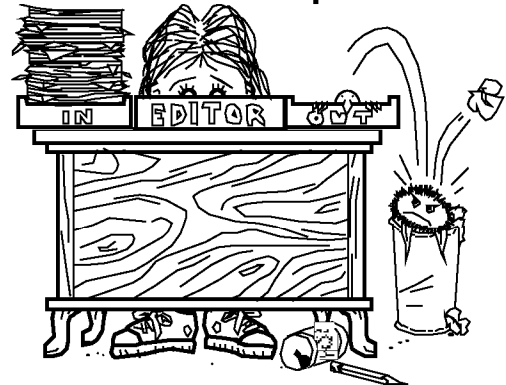
Veteran SEPA member Paul Trembly is Southern Skies Digital Cosmos associate editor. Paul works at the Orlando Science Center in Orlando, Florida. Look for Paul's review of StarGazer, a planetarium simulator that runs on both Wintel computers and Macs, on pages 10-13.

It would not be appropriate to recognize only those members who have recently assumed a leadership role in our organization. Elizabeth Wasiluk has authored our

Small Talk column, and Patrick McQuillen has been book review associate editor for longer than I've been editor. Dennis Cowles has been a long time and prolific contributor to Southern Skies of many technical articles on lunar and planetary science. He initiated the new Astro Web review feature a couple of years ago, and Kelly Quinn took over the job of compiling the Featured Planetarium column. Kelly is continuing in that position although the Bishop Planetarium has closed due to the fire that damaged the facility in August.

Individuals who compile our state news, President Dave Maness, and IPS Representative John Hare all help Southern Skies to keep you informed. Thank you.

Duncan R. Teague
Secretary/Treasurer
Southern Skies Editor
Craigmont Planetarium
Memphis, Tennessee



Mike Cutrera

Send your \$25.00 check made payable to SEPA to the following address:
Craigmont Planetarium, 3333 Covington Pike, Memphis, TN 38128 3902

Name		
Planetarium		
Organization		
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State	Zip	
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Area	Fax	
Position		
E-mail address		

Small Talk

Elizabeth Wasiluk
Small Talk Editor
Berkeley County Plan-
etarium



Since we gathered with GLPA in Kentucky, I've changed location. My former home is being converted into a law office, and for the second time in a year, I had to find a new place to live. Housing is at a premium in West Virginia's Eastern Rhandle. I finally found a new home, appropriately enough, just off Eclipse Street. Now I have things I hadn't before like a patio, a pool, a pantry, a linen closet, walk in closets, and storage under my bathroom sink. That took most of July and August. There are still boxes about, but I'm feeling more at home.

We all endured September 11th. I found out by calling my hairdresser, who said something about the World Trade Center and airplanes crashing into it and terrorists, and I dismissed her thinking it was a freak accident. Then I ran some errands, saw people gathered inside the library, and dismissed it as some private meeting.

I went into the library to gather some information on author Thomas Hardy, and I noticed a current events class watching TV almost too silently. Then we together watched a plane hit the second Tower and began to realize what was happening. Teachers and students gathered in the library pulled out atlases to check where the Pennsylvania plane hit. Social studies teacher Mr. Lyons told us this looked like war and was deeply concerned what might be coming next. I've never seen our students more concerned, scared, or serious. They actually relied on us for help.

The day continued. Though schools around us let students out early, we opted to keep our kids all day. Our principal said there seemed to be no danger; everybody would be remaining in school. No one continued with the day's lessons, and many classrooms turned on local television to learn what was going on.

As classes changed, kids weary with seriousness and grief tried making jokes. I heard in the hall, "Where's my girlfriend? I'm goin' out on a date tonight because I don't want to die a virgin." Things calmed down quickly, but the quiet, pensive hush in the hallway was most unusual.

School secretary Frances Canby and

I had planned to go to dinner and use a coupon to Cracker Barrel. My evening class had been canceled, but hers was still on, so we hoped dinner would cheer a very dark day. After we parted, I walked into my apartment and heard the phone ringing. It was SEPA president Dave Maness. He was returning from a wedding in New York. Since he was in the neighborhood he wanted to look in on my dome sweet dome. I was extremely honored. On the way to the planetarium, I kept worrying, if my planets were set correctly. Does he really want to see golf ball sized stars on the dome? Nothing is more intimidating than having a fellow planetarian in your dome someone from whom you can't easily hide a problem.

I gave a 10 minute tour of my tiny dome, and I began to feel proud. We challenged one another to an impromptu constellation shoot out. It was a draw impressive since he was not on his home turf, and my stars really are golf ball sized. I taught Dave off color constellation stories. (Can I get in trouble for corrupting the morals of our President?) I showed him my cheap and easy fix for the planet Venus projector not working on my star projector. It was a slide mount with a piece of aluminum foil poked through and a slide projector slightly off focus. I promised I would mention a great Website with space and science fiction music. I stumbled across it inside my new astronomy text *Cosmos: Astronomy for the New Millennium*. It's supposed to be for science fiction buffs, but I'll bet it'll help when you're searching for a proper tune for your next show.

At the following address is an extensive list of music and songs, many of which have an astronomical connection. This site was originally designed to be a science fiction music list, but there is an overlap with astronomical topics. Check out <http://www.cis.ohio.state.edu/hypertext/faq/usenet/music/sci_fi_refs/faq.html>. It's pretty amazing

Keep in touch and go visit a planetarium colleague sometime soon. When you do, drop a line and share the experience. I have e mail now, so you don't have any more excuses!

Astro-Video Review

The Doomsday Asteroid

Imagine a McDonald's restaurant given the task of protecting the planet from impending doom. Sounds a bit weird perhaps a lost manuscript from the late Douglas Adams, right? Well, according to Anglo Australian Observatory astronomer Duncan Steel, that gives you an idea of the number of astronomers who were searching for Earth orbit crossing objects in the mid 1990s, when Nova aired *The Doomsday Asteroid*. This was a bit of a timely piece, being made shortly after the Comet Shoemaker Levy 9 impacts on Jupiter. The media was still riding the shockwaves of the event.

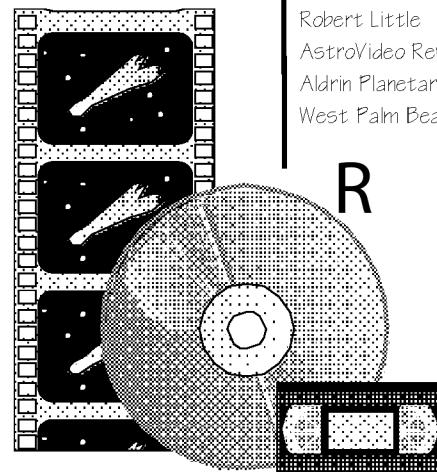
When this show aired, I was initially skeptical. With the impending cuts that were looming over PBS in 1995, was this a bit of sensationalism designed to create better ratings? Would good science reporting be sacrificed in the name of public relations?

Perhaps it was produced to cash in on the publicity of Shoemaker Levy, but I am pleased to say that the product was up to Nova standards. The material covered was presented in a way that it wouldn't overwhelm the average viewer. Facts presented were based on the knowledge available,

and the producers went out of their way to find experts in the fields, notably the late Eugene Shoemaker. Frequent comparisons to nuclear weapons may have seemed a bit dire, coming as they were only a few years after the end of the Cold War. This was, and still is, however, the only way to compare the magnitude of such a theoretical impact.

The next time that you decide to watch *Deep Impact* or worse, *Armageddon* or any of those made for TV movies, be sure to watch *The Doomsday Asteroid* not long after. I'm sure the dose of good science following bad should help to cure any nausea produced by those lackluster attempts at science fiction.

The Doomsday Asteroid costs \$19.95 from WGBH Boston Video. Call 800 949 8670 x498, and ask for item number WGD2212.

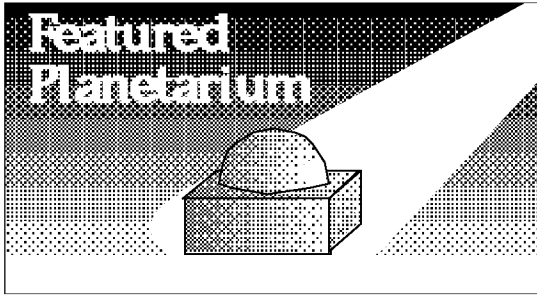


Robert Little
AstroVideo Review Editor
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You can find NOVA on the PBS Website. They provide numerous aids for teachers to use to prepare students for viewing and getting the most out of their videos. Go to <http://www.pbs.org/wgbh/nova/spacewatch/>.

Featured Planetarium: Robeson Planetarium, Lumberton, NC



Kelly Quinn
Featured Planetarium Ed.
Bradenton, Florida

Left: Robeson Planetarium
Lumberton, North Carolina

For over thirty years, the Robeson Planetarium and Science Center has served the students of southeastern North Carolina. Located in Lumberton, one mile from bustling I 95, the planetarium continues its mission to introduce grade school students to the wonders of astronomy and



science.

The planetarium is a part of the Robeson County school system and was one of the first collaborative projects of the six independent school systems existing before merger. In 1966, the school systems applied for a matching grant available through Title III of the Elementary and Secondary Education Act. Prison labor laid the brick, and students from a local technical college wired the building for electricity.

In 1968 one of the last Spitz A3P s ever built was installed to provide stars to a 30 dome. In January 1969, the facility opened to the public, with James Hooks, a former high school teacher, serving as the planetarium director. In February 1970 Mr. Hooks invited several members of the planetarium community to his facility for an informal meeting that later grew into the Southeastern Planetarium Associa

tion.

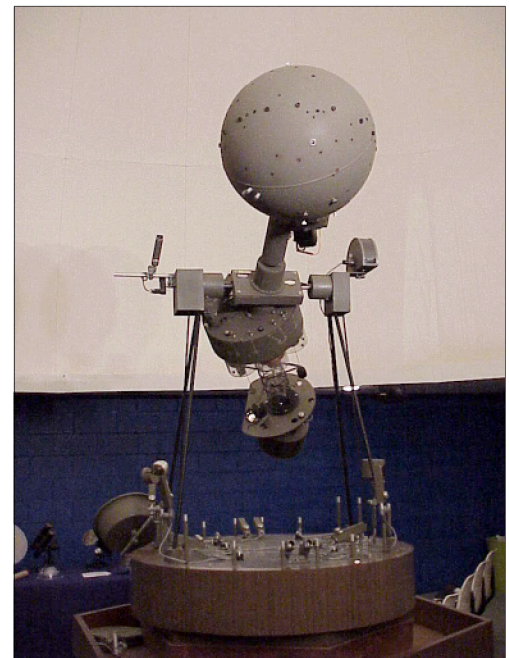
Over Mr. Hooks 30 year tenure, the facility expanded technologically to include slide projection, AVL automation, Sony video, and NASA TV satellite access. Approximately 15,000 students and public visitors came through the doors each year.

The planetarium obtained an activity bus and began scheduling and transporting Robeson County students to the facility. In 1986 a Science and Technology Center was constructed around the planetarium. Exhibits on loan from NASA joined a working beehive and a retired airplane as displays for the new center. The Galaxy Gift Shop opened to the delight of school children in 1998.

High school physics/ physical science teacher Matthew Perkins, who formerly served as a student worker at the Weatherford Planetarium at Berea College in Berea, Kentucky, became the facility's second director in July 1999.

The time was ripe for renovations, and a five year plan was developed. The entire roster of programs was to be replaced, and lesson plans conforming to the

Far Right: Robeson's
Spitz A3P Star Projector



North Carolina Standard Course of Study were to be developed within the year.

John Hare and ASH Enterprises were brought in to refurbish the original Spitz A3P in February 2000. East Coast Control was contracted to install their control system, a new sound system, and a Barco Data708 video projector compatible with automated VCR, DVD, laser disk, and Internet sources. Future renovations include a new roof, new seating and carpet, new exhibits for the Science Center, construction of a light trap, and construction of a false wall to hide slide projectors.

With a staff of three (director, secretary, and custodian/bus driver), the Robeson Planetarium hopes in the future to establish a system of student volunteers and paid teachers, allowing it to expand its public offerings to weekends.

The planetarium is available to school groups outside of Robeson County during the week for a small admission fee per student. The planetarium also hosts public programs on various nights throughout the year, including Explorers of Mauna Kea, (Bishop Hawaii) Spirits from the Sky, (Adler) and two Winter/Christmas programs, Tis The Season, and Winter Wonders (Minneapolis). Annual astronomy workshops are held for Boy Scouts and Girl Scouts. Science Olympiad students also use the planetarium to study the constellations and basic principles of astronomy.

The planetarium continues to focus on its mission to serve the teachers and students of the Public Schools of Robeson County. Students in grades three through eight visit the planetarium once a year. A five year progression of programming takes students from the planets and the Moon with Planet Patrol (Sudekum) or Larry Cat in Space in 3rd grade, Follow the Drinking Gourd (New Jersey) in 4th, energy and light with A Universe of Energy (Robeson) in 5th, the seasons or Mars with Reason for the Seasons (Robeson) or Destination Mars (Burke Baker) in 6th, terrestrial weather Weather Watch (Robeson) in 7th, to Newton's laws and gravity Worlds In Motion (Sudekum) in 8th.

Lesson plans and astronomical ac



Right: Science Olympiad students also use the planetarium to study the constellations and basic principles of astronomy.

tivities are available to download from the planetarium's Web site located at the URL <<http://www.robesonky.com>> in both Microsoft Word and Adobe PDF formats. Teachers can schedule visits via the Internet and view the complete schedule.

A reflector and a refractor serve as demonstration telescopes for high school classes learning about optics and students and the community for stargazing.

The planetarium's mission expanded beyond grades 3 through 8 with the addition of a Starlab portable planetarium. Starlab made its debut in the fall of 2001 for high school Earth Science classes too far away to transport to the planetarium within a single block of the class day and for students in grades K through 2. The planetarium is offering a spring workshop to train high school teachers how to set up and use Starlab on their own, allowing it to be available for checkout.

The 2001-2002 school year also marks the debut of Spanish language programs. The 2000 census listed six percent of the local population as Hispanic. To meet the needs of this growing audience, Robeson Planetarium set out to find Spanish language soundtracks of its existing programs. Two such soundtracks were scheduled to debut in September 2001: Stardate: Ancient Horizons (Science Museum of Virginia) and Larry, Cat in Space.

With the aid of a translated script from Geoff Holt of the Madison Metropolitan School District Planetarium, Tis The Season is scheduled to debut in December 2001.



<www.robesonky.com>

Book Review: Failure is Not an Option

Patrick McQuillen
Book Review Editor
Alexander Brest
Planetarium
Jacksonville, Florida



When thinking about the accomplishments of the American space program, one quickly runs down a list of astronauts: Alan Shepard, John Glenn, Neil Armstrong, Buzz Aldrin, Jim Lovell, Sally Ride, Rhea Seddon, Story Musgrave, John Glenn (again) and so on. Not often do we mention the folks on the ground, in mission control, who watch gauges, solve problems, lose sleep, and probably worry more about whether or not the mission will be a success than the people actually on the spacecraft. This book is written by and about folks who really control the

ing the spacecraft is fascinating reading considering our vantage point in the GPS era. With a lot of determination and some smart folks, the Mercury program was a roaring success.

I arrived at the local Barnes and Noble bookstore a short time before Mr. Kranz was due to speak. My staff arrived shortly after me, and we waited, marveling at how lucky we were to get to hear him speak (for free even). But that does happen from time to time when you live in Florida. A group of high school kids arrived and sat in front of us. While listening to their not so quiet conversation, we came to learn that they were there because their teacher assigned the talk as extra credit. They even had to get their flyer signed to prove they attended. (I hope the teacher let them keep it.) The students had no idea who Mr. Kranz was. With typical high schooler mentality they tried to figure it out without really searching out the information they needed.

He is some famous astronaut. Yeah, I think he was on Apollo 13. No, that was Tom Hanks. Dummy, Tom Hanks played Jim Lovell the astronaut. Oh, so I guess he isn't either of those guys. About this time one of the guys in the class arrived who actually knew a bit about the space program and told them that the guy who was going to talk was the guy in charge of mission control for all those important missions.

Mr. Kranz did an excellent job capturing the attention of the high school students and the other 50 or so attendees who crammed into the small area between cookbooks and romance novels. About half of his talk was a question and answer period. He answered all the obvious questions from folks. What is it like to be in charge of mission control during a mission? Where you worried that the Apollo 13 astronauts wouldn't get back home? Wouldn't you explode if you went into space because there is no air? (This from a 7 year old). How did you feel when Apollo 11 actually landed? I decided to ask a question that would perhaps be more telling. My question: Since you worked in mission control

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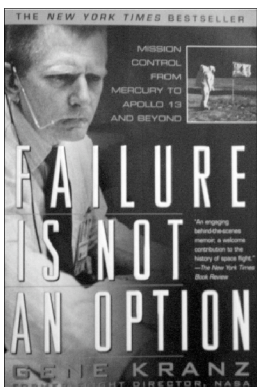
mission.

Back in May I had taken a Thursday off to make up for a weekend day that I had recently worked. Thursday happens to be the day that we often go to a restaurant/drinking establish near the planetarium at which an improv comedy group performs. I called my staff to see if any of them were going. My staff informed me that no they were not going because they had something better to do. What could be better? I asked. They responded, Well we thought we would go hear Gene Kranz talk about his new book and get an autographed copy. This was certainly better. I changed my plans.

The book starts off with the early days of the space program. With the Mercury missions, the procedures, techniques, rules, and, heck, even the computers necessary to run a mission had to be invented. Mr. Kranz does a great job of giving you an insider's view of the hectic days of the early space program. He was given the opportunity to go to what was to become Kennedy Space Center when it was mostly alligators and swamp and get in on the ground floor of the whole deal. His descriptions of how rudimentary the equipment was for monitoring and track

Failure Is Not An Option
by Gene E. Kranz
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Book Review: Journey Beyond Selene

When one thinks of writing a book (or planetarium script) about the solar system, usually the focus is placed on planets. Each planet is visited in turn, and things are seen and learned at each. In *Journey Beyond Selene*, Jeffery Kluger takes an approach that is seldom followed. He hardly mentions the planets at all.

This book is about moons. Not only our own Moon, which the Greeks called Selene, but also every other moon in the solar system is discussed. The book is divided into two parts. Part one focuses on the Earth's nearest neighbor; part two, on all the rest of the moons in the solar system.

Jeffery Kluger has a way of telling a story that gets you interested and even involved in the progress of the tale. Even with stories where you know the outcome (Apollo 13), his writing style will engage you sufficiently to make you want to read it all in one sitting to find out the conclusion. A good example of this is the telling of the tale of the discovery of Io's volcanoes.

We take for granted many facts that we present to visitors on a daily basis. We tell these tidbits of information as though they were known for all time. If we stop and think about it, much of the information we present has been known only for a relatively short period of time—at least compared to the age of the Universe. If you mention Jupiter's moon Io, probably the first thing you will mention (and probably the reason you are talking about it) is the fact that Io has lots of volcanoes.

This was not only unknown but also unimagined prior to the 1977 visits of the Voyager spacecraft to the Jovian system. Scientists were not even looking for volcanoes. Kluger does a great job of describing how this now obvious fact came to light.

As you probably already may surmise, the photos beamed to Earth from spacecraft at the far reaches of the solar system do not come back neat and properly exposed for brightness and color like the ones you get from the local photo store. Most are over or underexposed. Exposure times are based on expected lighting situations which depend on the location and orientation of the spacecraft at the time the photo is snapped. Often several slightly

different exposure times are shot so that hopefully one (or several) pictures will capture all the elusive and never before seen details of the object in focus. Photos are snapped, stored on tape, and beamed to Earth long after the close approach (and time to reshoot bad shots) has passed. Many photos may not have the object in question in the frame if the spacecraft is slightly misaligned during the photo op. Lots of the photos that at first seem totally bad, need to be dabbled with on the computer to create the awe inspiring photos we all love.

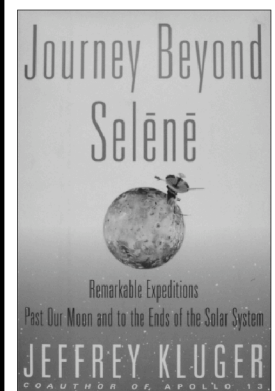
In the case of Io one member of the navigation team was examining overexposed photos of Io in order to determine the exact location of Voyager by using Io and the stars in the frame. On several frames there was a bump on the edge of Io. In every frame that showed a bump on Io, the bump was in the same location. Today of course we know that that bump was one of the many active volcanoes on Io. If all the photos had been correctly exposed, the volcano would have been missed. They are that faint compared to Io's light surface.

The story of the Ranger and Surveyor spacecraft's trials and tribulations at tempting to reach our own Moon makes fascinating reading. It is amazing how close both of those projects were to being cancelled. If either had been cancelled, JPL, then a relatively unknown offshoot of Cal Tech, would not have been able to do some of the missions it is famous for today.

All in all, this is a great book from an enjoyable to read standpoint. It is also a handy book to have on the shelf when writing the next tour the solar system planetarium program. Almost all the historical information on the known moons of the solar system (up to 1999) are located



Journey Beyond Selene
by Jeffery Kluger
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© 1999
\$26.00



Digital Cosmos

StarGazer 3.0



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For this issue, I took a look at Star Gazer 3.0 from Belew Spruce Software <www.belewspruce.com> for both Windows and Macs.

The first thing that struck me as I looked at the box, were the bright yellow letters across the bottom that clearly say **Interactive Educational Astronomy Software**. Further review of the box reveals that this software is aimed at the science teacher wanting something for their student labs, or the consumer who knows little or nothing about astronomy it says so on the box: ... An excellent teaching tool that's fun and easy to use! Star Gazer is an introductory educational software package designed to create an interest in astronomy... The repeated emphasis about features such as the history and descriptions of the U.S. manned space program, pictures from the Hubble Space Telescope, and photographs from astrophotographer John Chumack give the user a good idea of what to expect.

The only screen shots on the box are of the Windows version, not reassuring to a Mac user. There are Macintosh screen shots in the user manual. You can download the manual from the Web site.

The box contains a hybrid CD for Mac and Windows in a jewel case and a 32 page user manual. The manual is split roughly 50/50 between Windows and Mac, so you only get about 16 pages for your operating system of choice. Of those 16 pages, only

one is devoted to installation; the rest is devoted to using the software. More detailed operating instructions are found in the help file, but intuition worked well too.

The system requirements are another give away as to what to expect. For Windows you need a 486, 100 Mhz or faster, Win 3.1/95/98/NT, CD ROM, SVGA, 8 Mb RAM, and 10 Mb free drive space. A Mac must be a Power PC, Mac OS 7.0 or later, CD ROM, 8 Mb RAM, and 5 Mb free drive space. The fact that this will run on a 486 under Win 3.1 means compatibility with newer equipment may be a factor to consider. The system requirements were also very easy to find on the box, and not buried on the bottom in small print.

I first installed Star Gazer on my desktop machine, a Dell 900 MHz Pentium III running Win 2000. It worked with only two exceptions the help file did not load, and the program did not like my standard screen resolution of 1024 x 768. When I adjusted the resolution down to 800 x 600 and then again to 640 x 480 it ran without problems. The program would run at the higher resolution, but certain control buttons would be over the image I was trying to look at rather being to the lower right as they were at the lower resolutions. The manual says Star Gazer will work with all three resolutions I tried. At 900 Mhz certain aspects of the program almost ran too fast to be useful.

In truth, it is doubtful anyone in the target market of this software would be running Win 2000, so I next installed it on a Gateway Pentium 75 and a 233Mhz Dell Pentium II, both running Win 95. This time the help file loaded and I had no problems with the any of the screen resolutions.

Note that the box makes no mention of Windows ME, and I did not have a machine running ME on which to try it. It has been my experience that Win ME is even more picky than Win 2000.

For the Macintosh platform the test machine was a 500 Mhz G4 running OS 9.0.4. It installed faster than it did on the Windows machines, there were no problems with resolution, and the help file loaded without difficulties.

When the software first comes up, it defaults to no location, so you have a blank star field. You can select your location in a couple of ways, either by selecting the city of choice from one of the many lists, or by entering your latitude and longitude. As luck would have it, Orlando was not on the list of predefined cities, so I entered my position and was rewarded with a nice simple 3.5 magnitude star field consistent with a classroom or city bound home user. The magnitude displayed cannot be changed.

It was about now that I discovered the

the ability to type a date or time though.

Other objects that can be viewed include galaxies, Messier objects, globular clusters, and grid lines. With the exception of the grids, these objects seem an odd choice for a star field that only goes to 3.5 magnitude. Granted clicking on their labels brings up information about them, but seems out of context with the apparent aim of the software as being for the beginner.

You can move the sky in either hourly or daily increments, however these increments are set and cannot be changed. I

found the motion to be rather jerky; more of jump from one time to the next rather than a smooth rotation. The Mac was a bit more smooth, but it was still a hard jump.

There is a find feature, but it is not as good as it could be. You can find by constellation, star, globular, Messier, or galaxy. If your selected object is visible, the program will show you its location, but if the object is below the horizon, the program will simply tell you the rise time. To view the object you must change the time setting to get your object above the horizon. While this is a good

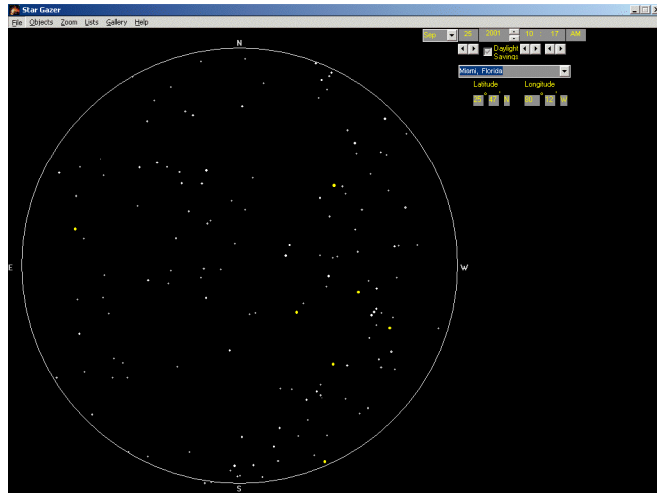
way to reinforce the idea that you can't always see an object, it was a nuisance at times. The fact that you can't find by planet, Sun, or Moon seemed lacking a bit. The icons for these objects are good sized, but if you don't know where to look for the object, being able to do a find for it would be helpful.

There is a zoom feature that is very good. Not only do you begin to find fainter stars (5th or 6th magnitude) but also things like the double stars Alcor and Mizar become

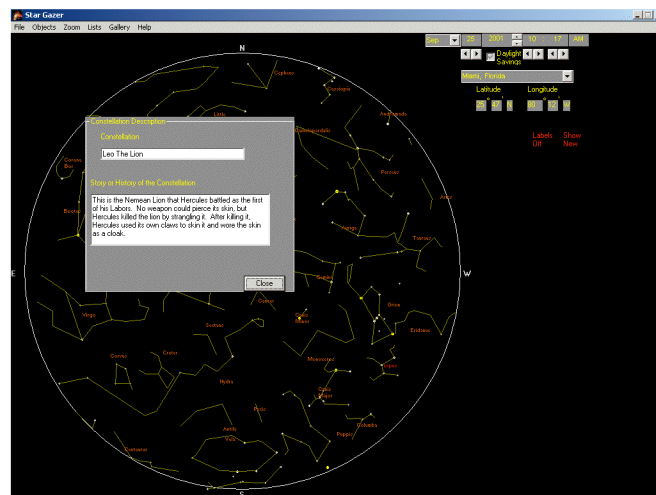
biggest irritant with this software; there is no way to save your location! Every time you start the program you have to select your location from the lists, or enter it by hand. This can get old very quickly for the home user; students might not find this to be a problem, as the software may not be used on a daily basis. Neither the Mac nor the Windows versions allow a default setting for your home location.

Some of the functions are very good and intuitive. On the menus, when you select something, such as constellations, the menu changes from Constellation ON to Constellation OFF. This is very clear and easy to understand. When you click on a constellation's label, you get the story behind the constellation. When you click on a planet, the Sun, or Moon, you get rise and set times, and a photo of the object.

Setting time and date required the use of up/down buttons, but since each section can be changed individually, this is not a problem. I would prefer having



Left: StarGazer 3.0's basic star chart



Right: StarGazer 3.0's constellation mythology window superimposed over its star chart

clearly visible as two stars and not just a single point.

There are several database type lists available as well: star types, the 20 brightest stars, the 20 closest stars, eclipse tables, comets, and the planets, to name a few. Some of the information such as spectral class on the star lists is better aimed at a classroom setting than the home user. There is also a database on all the manned United States space missions through 1999.

The eclipse tables matched with other sources I checked, but they were lacking in start and end times, something that I think would be useful in both a classroom setting or for the home user. Of course we all know that to get the correct times people should call their local planetarium. <Grin>

There are several photo galleries available, mainly from NASA, the Hubble Space Telescope, and astrophotographer John Chumack. In all there are about 450 images of all different types.

They are broken down by object and area so it is not too hard to find what you want. Included in this collection are photos of spacecraft. Included with each image is a brief description as well. All the images can be printed.

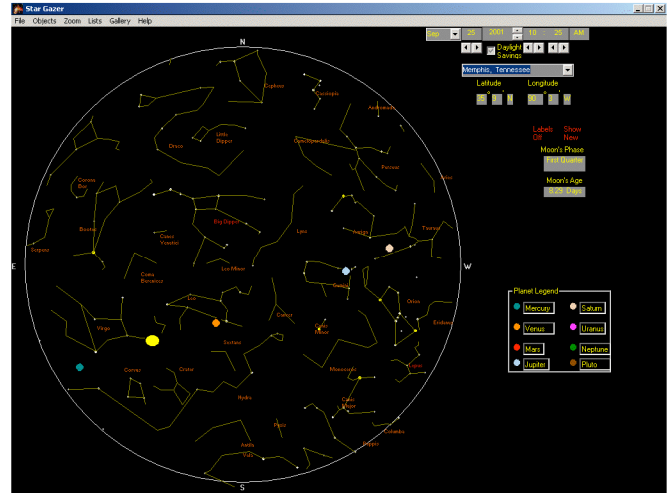
Another interesting feature is the orbit

motion a concept not always understood by students.

Again, I could not change the rate at which time passed. This feature worked best on the Pentium 75 machine. The slower processor helps keep the set time rate down to something useful. The Mac version was a close second on this; again, a slower processor would have helped.

The printed star charts are very simple.

Right: StarGazer 3.0's star chart with planet symbols among the stars



They are good for use outside or by students. There is no legend on the printout, and the planet icons are rather big compared to the stars. When I printed a star chart for a given latitude and longitude that I had entered, such as Orlando, the latitude and longitude information was printed vertically along the left margin. Also, there are no options on how to print the star chart.

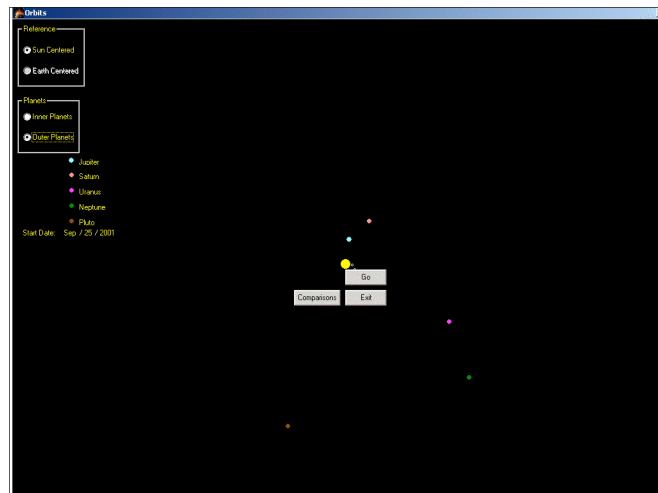
Data tables printed fine and would make good reference tools for students. This was one area where the Mac version failed. No matter what I tried to print, I crashed the machine. I was never able to determine if it was due to the software or to our network connection to the printer. I suspect the latter, however, since just prior to each crash I received a print spooler error.

[Perhaps you need a new printer driver for Mac OS 9.0.4

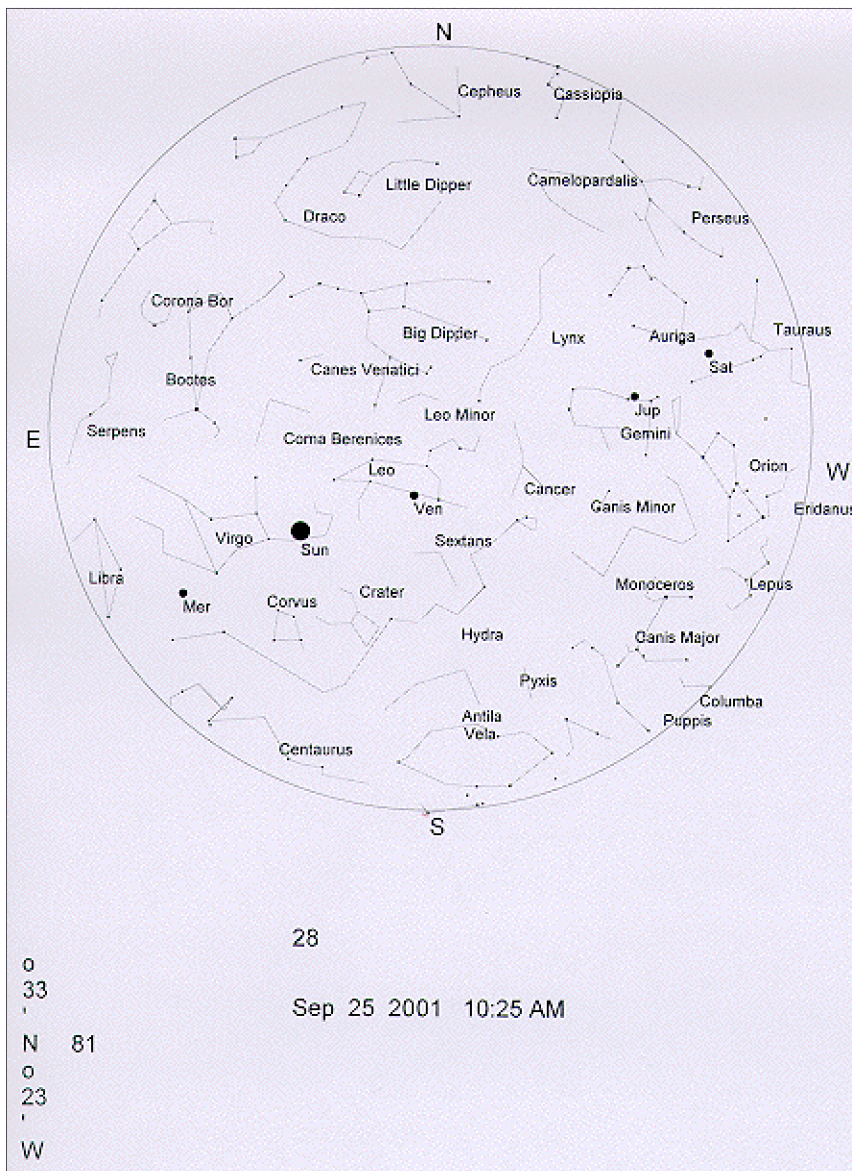
for your non Apple printer. The relatively newer OS is very different from versions between 7.0 and 8.6. Ed.]

Everything is cross linked to a glossary, another useful feature for students. I randomly checked some definitions; they are

Left: StarGazer 3.0's orbit simulator feature



simulator. The orbits of the planets can be viewed either as Sun centered or Earth centered. But only in Sun centered mode do you get tick marks along the orbits. I think having tick marks would make it a little easier to see things like retrograde



StarGazer 3.0
continued

Left: StarGazer 3.0's
printed star chart

issue, but they were not sure given the nature of the error message we were getting.

The program is \$29.95 plus \$2 shipping for a single copy; a Lab Pack of 5 is \$119.80 plus \$3 shipping. The Lab Pack is a good deal for anyone needing a simple astronomy program for lab use. Upgrades are only \$10.

Included with the copy sent me was the beta of Star Gazer 4.0. I loaded it on the Win 95 machine. (It refused to load under Win 2000, and there was no Mac version yet.)

Version 4 has updated lists for manned space missions, eclipses, and comets. It includes extra solar planets.

New features in

include the ability to control the passage of time for the orbit simulator as well as daily and hourly motion. Another nice addition is a magnitude cutoff for the star field. You still can't save a location if it's not in the standard lists, but this might not be a problem in a lab or school setting.

This is not software for everyday use by the planetarian in need of detailed astronomy data, nor is it intended to be. It is aimed at the beginner, and for the most part it hits the target. Astronomy educators in need of a relatively inexpensive program for introductory astronomy students will find this software meets your needs. For home users there are more informative programs that cost just a bit more which would better suit your needs.

In either case, wait for Version 4.0. Its added features will be worth the wait.

concise and worded well for beginners.

The Belew Spruce Web site has a list of FAQs for installation problems and a place to report bugs and suggestions. This developer is aware there might be things he missed, he wants feedback from the end user, and he's open to suggestions.

There is not much difference between the Mac or Windows versions. The GUI is better on the Mac than on Windows. There is a more friendly nature to it. Controls that look label like in Windows look button like on the Mac. I think users would prefer the Mac version this coming from a die hard Microsoft supporter.

The Mac version performed better even at the higher processor speed than did any of the PC versions. The Mac users here at the Science Center all agreed that this program would most likely have problems running under OS X, and that running under OS 7 or 8 might solve the printing

News from SEPA States

George Fleenor
Bishop Planetarium
Bradenton, Florida

Astronaut Memorial Planetarium, Cocoa
No report from Cocoa at this time since their Director has had his hands full in a pleasant way! Congratulations to Mark and Page Howard on the arrival of their son, James, born August 9, 2001. Congratulations to the proud Grandparents Oma (Linda Hare) and Granddude (John Hare).

Brest Planetarium, Jacksonville
Patrick McQuillen reports that the Alexander Brest Planetarium at the Museum of Science and History in Jacksonville is busy. The giant robotic dinosaurs are again as extinct in northern Florida as the Dinosaurs! The exhibit has ended. (This also ended the loud roaring dino noises that were keeping the planetarium director awake during the day, as the dinos were only 20 feet from his office.)

The planetarium ran Spring Skies (a live sky tour) and The Explorers (from the Bishop museum in Hawaii) as the public program until the Thanksgiving holiday. This is the first Explorers program that focuses on the Polynesian explorers. Visitors really seem to enjoy the live part of the program that involves investigating daily motion and the height of the North Star on different locations on the Earth. It seems to capture their interest in a memorable way. Several children and a few adults have returned to the planetarium and commented on how they enjoyed the live part of the program.

Our evening weekend laser show run has ended. We are still offering a family oriented program called Laser Fun 2 (from Mike Dunn) that we have modified into a 25 minute program. We also added God Bless the USA by Lee Greenwood (from Mike's country show) to the very end of the program. This has been a huge hit. Along with Coming to America by Neil Diamond and Don't Stop by Fleetwood Mac, the show is rather patriotic and uplifting, two things that visitors appreciate lately. We are also still running Backstreet Boys/ NSYNC that has been appreciated by our female visitors from ages 9-15 and their automobile driving parents.

Over the Thanksgiving, Christmas,

New Year's, etc. holiday time, we will be showing Star of Wonder for the 13th annual presentation. This program has become a favorite among museum visitors. As a children's offering during this time, we will be running The Alien Who Stole Christmas (also for the 13th time). And Holiday Skies, our live tour of the current night skies, will point out some of the natural holiday lights.

Holiday laser shows include Winter Wonderland, which has a wide range of traditional Christmas/ Holiday songs and Peter and the Wolf. These will run in conjunction with our Holiday Exhibit of Model Trains. Visitors should be able to enter the museum and really get in the holiday spirit for their entire visit.

Bishop Planetarium, Bradenton

George Fleenor reports: On Thursday, August 23, 2001, at 5:30 a.m., a fire was reported to authorities via the fire alarm system, and trucks were dispatched immediately to the South Florida Museum's Bishop Planetarium. Fire crews worked closely with Maintenance Department Head, Bill Serdyn, and me in trying to locate where in the Planetarium Theater the fire was and what was the best way to get to it with minimal structural damage to the building. The fire was extinguished by 7:30 a.m. and an additional investigation is pending. Local and state investigators did report that it was electrical in nature. As of October 10, 2001, no definite cause has been reported. Four fifths of the front stage of the theater was destroyed by the blaze, and the whole theater was subject to intense heat, smoke, and water damage. Everything in the theater was lost. Surrounding support facilities and offices were also affected by heavy smoke and water damage. The amount of loss has yet to be determined, and the Bishop Planetarium is closed for an indefinite period of time.

As of August 29, all of the part time Planetarium employee's positions had been terminated. As of September 20, 2001, Planetarium Assistant/ Producer Brett Jacobs and Planetarium Educator/ Producer Kelly Quinn's positions had also been terminated, much to my dismay. I

have no idea what is going to happen in the future since I have not been involved in any of the discussions between the Museum's Executive Director, Dr. Peter Bennett and the Board of Directors.

Kelly and I made several attempts to create and provide astronomy programming in other areas of the facility and/or in schools but to no avail. The leadership of the museum was not interested. I should note that we were offered free use, of a StarLab, in addition to a couple of Micro Yag lasers for outdoor fundraising shows. The amount of support from the Planetarium and associated Professional community has been appreciated.

The observatory is also shut down for an indefinite period of time. It was not affected, nor was the access to the observatory, by the fire. All astronomy programming at the South Florida Museum Bishop Planetarium has been stopped for an indefinite period of time.

I have no clue of what is to become of the Bishop Planetarium, nor do I have a clue about what is to become of my job. I am a Planetarian and need to be in a dome. If I can financially afford to move and a position becomes available, I will eagerly investigate it. As for my staff, Kelly and Brett, they too are in need of a job.

Brett is a talented laser/computer graphic producer, and Kelly is one of the best educator/producers in our profession. Some facility will be fortunate to snatch up these two. I wish them the best. We had great plans for the future, and it saddens me that we will not have the opportunity to delve into the unique programming opportunities that we had envisioned.

On the light pollution front: Locally, I have been rather quiet due to all of the issues facing the planetarium. This is really sad since we had such momentum going for change. As chair for the Informal Education in Science Centers and Planetariums Work Group for IDA, I/we have been challenged to produce a traveling exhibit that is to debut next October in Boston. The Work Group also consists of many Planetarians across the country that are generating some great ideas. For those of you with exhibit experience and who have any suggestions that would help us, please contact me ASAP. Thanks. <www.bishopplanetarium.org>

Buehler Planetarium, Davie

Susan J. Barnett reports: Our weekend public shows are Galaxies and Max's Fly

ing Saucer. The weekday rotation includes The Explorers, The People, Ancient Horizons, Voyager Encounters, The Mars Show, and The Secret of the Cardboard Rocket. A new show we are introducing this fall is Amazing Stargazing. Additional shows reprising this fall are MoonWitch, Tis the Season, and Season of Light.

The Orlando Science Center, Orlando

Paul Trembly reports things have been rather quiet in Orlando. On August 4th, we had Dr. Gil Yanow from JPL give a presentation about the Genesis mission. His talk was well attended not only by members of local astronomy organizations, but also by the general public. WSKY: Radio Station of the Stars and Orlando By Night open September 29, as does our new film Journey into Amazing Caves.

Tropical storm Gabriel caused some leakage in our observatory and in an exhibit hall, but no serious damage was done. We will have to replace some floor tiles, dry some carpet, and repaint some drywall, but no equipment was damaged.

Poinciana Planetarium, Boynton Beach

The Poinciana Planetarium continues its excellent series of no public shows now through the winter season. Public planetarium programs that won't be shown this season include In My Backyard, The Little Star that Could, The Mars Show, Cowboy Astronomer, Planet Patrol, and Starbound to name a few.

In addition to its series of no public shows, Dave Menke has a monthly series on each third Thursday of no astronomy lectures. Upcoming topics for these non-existent lectures that won't ever be given include the Harvest Moon, in October; the November 1982 Meteorite, in November; and Geminds from Afar, in December.

During regular school days Dave presents a series of astronomy lessons in the planetarium, designed for each grade level from K-5. Lesson times are typically 8:15 a.m., 9:15 a.m., 10:30 a.m., and 12:30 p.m., and they are not open to the public, or to any school students not at Poinciana. Admission is free.

Clear mornings and early afternoons, the Poinciana Observatory is open in the courtyard (10 inch computer controlled Meade reflector) for viewing Solar Max. Admission is free for Poinciana students and teachers, weather permitting.

The Poinciana Planetarium is open on

regular school days for Palm Beach County Schools academic calendar only from 8 a.m. - 3 p.m. It is closed nights, weekends, holidays, and summers.

For questions about our superb astronomy program, e mail Dave at FamAstro@aol.com.

Buzz Aldrin Planetarium, West Palm Beach

George Fleenor
Bishop Planetarium
Bradenton, Florida

In May, Leslie Bochenski moved from Hopkins Planetarium in Roanoke, Virginia to accept the vacant Planetarium Director position in West Palm Beach. We are currently featuring *How's the Weather Up There?* and the live planetarium show *Night Skies Over the Palm Beaches*. School bookings are up and keeping us busy with about ten different shows from which teachers can choose.

After a six month hiatus, our laser is back from being repaired, and the Friday night laser concerts are a hit, filling the planetarium to an average of 70% capacity since re opening the laser shows. *How's the Weather Up There?* opened three weeks late, due to production snafus and flooding

from Tropical Storm Gabrielle, which shut down the museum for three days. There was no flooding inside, but the only road to the facility was impassable.

West Palm Beach ABC meteorologist Kevin Skarupa narrates, and the part of a groundhog (or is it a woodchuck?) is performed by our own Dave Baker. Robert Little painted original artwork for the show, including a number of adorable images of the groundhog.

I want to extend a very special thanks to Todd Shisher for providing me with a finished version of the script for this show, which I only had to edit to add some local flavor.

On a different note Astronomy Outreach Educator Vic Stryker is leaving us in October to become a cruise astronomer with Holland America lines. He will travel to many exotic destinations, including Antarctica, sharing his love of the skies. We wish Vic happiness and safe travels.

Fernbank Science Center, Atlanta

David Dundee reports: We are playing *Between The Planets* in the theater and *Small Stuff* for children. We have been interviewing candidates to replace Rick Willamon, who retired. The new meteorite and tektite exhibit is up in our hall. We continue to gather money and plan for theater renovation. The Science Center has a new director Dr. William Sudduth, who was director at The Science Place in Dallas, Texas.

Jim Greenhouse
& Carole Helper
Mark Smith Planetarium
Macon, Georgia

Wetherbee Planetarium, Albany

Lisa Lofton writes of the following experience she recently had. It may be published in their upcoming newsletter or the next, with the title *My Husband, Jupiter?*

One of the great pleasures of my job is touring school groups through the Planetarium. Before students enter the Planetarium, however, my coworker, Lisa Roth, who is responsible for touring students through the Science Discovery Center, introduces me not only as Lisa, Planetarium Curator, but also as the Queen of Outer Space. I take tremendous pride in this title, not to mention is a great ice breaker for the students who may be a bit apprehensive

about entering this unusual room.

Recently, I was introduced by Lisa to a group of 5th graders touring here from Cairo, Georgia. Students were seated and their show began: a tour of the entire Solar System. At each stop, information is given about the planet including the meaning of the planet name. For example, Mars is known as the God of War, Pluto is God of the Underworld, and Jupiter is King of Planets as it is the largest of all the planets.

Armed with this information, post review of the planets with the students gave reason enough for one young lady to raise her hand with a question. *Is Jupiter your husband?* she asked. Somewhat taken aback and quite perplexed, I asked, *What do you mean?* She said, *Well, if you are the Queen of Outer Space, then Jupiter must be your husband. We all had a good laugh, and I agreed I was, indeed, married to Jupiter and together we would rule the Universe!*

By the way, please don't tell my earth bound husband as he may not be too pleased with this celestial news. It may send him into orbit!

Lisa also reports that she just recently got in *Season of Light*, aka *Tis the Season*.

A local sponsor was found which enabled them to make this purchase. She is really pleased to have the new show.

Georgia Southern University Planetarium, Statesboro

Becky Lowder reports: Our fall 2001 public evenings are as follows: September 21: Welcome to Outer Space (Becky Lowder); October 26: Exploration of Mars (Dr. Ben Zellner); November 16: The Secret Lives of Galaxies (Dr. Clayton Heller); December 7: The Christmas Sky (Becky Lowder) All presentations begin at 7:30 p.m. Telescopic observing will follow, if

skies are clear. All events are at no charge, and all are welcome.

Mark Smith Planetarium, Macon

Jim and Carole have now recovered from the invasion of robotic dinosaurs that took over practically the entire Museum. We are running In My Backyard, and will once again present Strassenburgh's The Story of The Star during December. We are delighted with our new Barco 808 video projector which, unlike our older projectors, can be automated, and we are busy modifying all our old shows to include it.

News from SEPA States
continued

Jim Greenhouse
& Carole Helper
Mark Smith Planetarium
Macon, Georgia

Freeport McMoRan Daily Living Science Center Planetarium, Kenner

Michael Sandras reports: First of all, I want to thank Dennis Cowles for taking over the Louisiana round up. I have been doing this for several years, and since I am currently serving as President Elect, Dennis thought it would be nice if I were relieved of the round up responsibility. I am sure Dennis will do an outstanding job with this responsibility.

It has finally happened! Construction has begun on our 50 ft planetarium. I think by now most of you are tired of hearing me discuss this project, but it is finally underway. It is scheduled to open by next summer. I want to thank everyone who has ever offered help and pity in getting this facility underway.

Currently we are showing the HPS Production The Stars of Autumn and several in house productions. Unfortunately the Science Center in which the planetarium is connected is going through a renovation and has caused headaches for the staff.

Tom Finicle has been giving a series of lectures on the U.S. manned space program. This has been well received by our visitors. Tom's enthusiasm is well evident in these presentations and it has seemed to arouse interest amongst those in attendance. These presentations are tied in with our tours through Space Station Kenner™, which continues to do well.

Lafayette Planetarium Lafayette

Lafayette Planetarium had a busy summer. We were able to do some public telescope observing for the occultation of Venus on the afternoon of July 17, and public solar visual and H α observing during a festival on the museum grounds in

September. There were also small public activities and some special exhibits for Space Frontier Week in July and National Aviation Week in August. Unfortunately, some of our activities planned for World Space Week in October a model rocket fly and a trip to Stennis Space Center in Mississippi have been canceled due to new security requirements. We still expect to do our annual Autumn Star Party, however.

Much of the staff's time has been taken up with our building project, and after ten difficult years there is very little but good news about that! Construction continues on schedule to finish by April, and many parts of the museum are becoming recognizable. The planetarium offices and work areas are framed (as is the planetarium itself), catwalks are up, and the projection booths are nearly finished. The Spitz 40 foot dome has arrived and awaits installation, and the same is true for much of the JHE control and production equipment. Twin observatory domes have been ordered and are expected to be on site in mid October, and the same is true of a new 15 inch Dobsonian telescope for star parties.

After three and a half years without a museum director, we expect the City Parish to hire one within a month. One of the few recent disappointments, however, is that our hope to hire an assistant planetarium curator has been delayed a year.

Museum and Planetarium staff, the Museum Board, and City Parish officials met twice during the summer with the company designing our long term exhibits, and the early concepts are eye popping. We expect the hallway leaving the planetarium area to present the history of space flight

Dennis Cowles
Audubon Louisiana Nature
Center Planetarium
New Orleans, Louisiana

Dennis Cowles
Audubon Louisiana Nature
Center Planetarium
New Orleans, Louisiana

in a setting resembling the inside of a space station. Another aerospace area will present the science of flight and space: how rockets work, lift, thrust, etc. The planetary science area will focus on our meteorite collection, cratering, and solar system evolution. These exhibits could be installed as early as 2003, although 2004-2005 is more likely.

St. Charles Parish Library and Planetarium, Luling

Autumn is here at the Saint Charles Parish Library & Planetarium and the rumble of children's feet are heard throughout the library. Getting back into the school show mode takes a few weeks of getting used to it again. Since all of our school presentations are given live, it also means a workout for the old vocal chords!

Our present show for the public is Light Years from Andromeda and is getting good comments from the public. Future shows include our beloved/dreaded The Christmas Star show for the holidays.

We are presently exploring the possibility of having our seating modified to have headrests. Can you imagine low back chairs without headrests? We have been operating with them for 24 years. Well, we never had to worry about people falling asleep during the shows. Hopefully we can get this done before the holidays.

Audubon Louisiana Nature Center Planetarium, New Orleans

Dennis Cowles reports that Mark Trotter has left the Nature Center to take a position as Senior Project Manager with Bowen Productions in Indianapolis. He will be much missed.

The Nature Center is offering the following programs for the public on weekends: The Sky Tonight, Planet Patrol, The Oldies Laser Show, and an occasional program on meteorites.

For school groups, the lineup includes the above programs plus The Little Star That Could, a variety of laser shows, another program on how lasers work, and Wonderful Sky, a program that Mark wrote and produced before he left the Nature Center to join the staff of Bowen Productions.

The Nature Center has finally received the long-awaited DayStar H α solar filter. They have a 0.6Å ATM filter for an 8 inch f/10 Celestron SCT. The views are superb. And true to predictions, a line forms as

soon as the planetarium volunteers and staff begin setting up the telescope.

For extra punch, after viewing the Sun, the staff shows the current Sun image in H α from Big Bear Solar Observatory <www.bbso.njit.edu>.

The conversations generally run some thing like this:

Visitor: We just saw that.

Staff Member: True, but this image was taken at a big professional observatory, and you were just looking through an amateur sized telescope.

Visitor: They look just the same!

Staff Member: Exactly!

Visitor: [Silence.]

The planetarium staff is busy training volunteers to operate the telescope for regular weekend solar observing (when those pesky white grayish floaty things don't intervene).

Initially there will be regular observing on the third Saturday of each month, but by the end of next year they hope to have enough volunteers trained to offer solar observing every Saturday and Sunday.

The Nature Center has acquired a nice Oum Rokba meteorite (H5 chondrite, 236 gram individual) for use in programs. The meteorite is interesting because there are some large cracks in it, and desert pavement material has become embedded within these cracks, which allows for discussion of erosion processes that break meteorites down.

As usual, the meteorite was acquired from Blaine Reed. If you are not on his mailing list of meteorites, you should be. Here's his address: Blaine Reed, P.O. Box 1141, Delta, Colorado 81614; Phone/Fax (970) 874 1487

Finally, Dennis continues to translate abstracts from the French journal Planétariums for The Planetarian.

[When do you sleep, Dennis? Ed]

Kelly Space Voyager Planetarium, Charlotte

The planetarium is closed until further notice. Omnimax films are being shown regularly, but there are currently no planetarium shows running.

An exhibit, International Space Station: The Earth Tour, which was developed by Discovery Place in conjunction with NASA and the United States Space Enterprises begins a nationwide tour with a run at Discovery Place through January 1, 2002. This 5,000 square foot exhibit uses hands on demonstrations; simulations, models and presentations to examine how teams of international scientists live and work for extended times in space.

Morehead Planetarium, Chapel Hill

Hopefully everyone has updated his or her bookmarks by now, but just in case, the URL for Morehead Planetarium is now <www.morehead.unc.edu>.

A new show, Solar System Adventure, has been completed recently. It takes the visitor on a voyage to worlds beyond our own.

Galaxy Fest, 2001 was held on Saturday, May 19th. This event was completely free due to the generous support of over 20 area businesses. Galaxy Fest is an outdoor community festival with crafts, music, food, amusement rides (the Moon walk and Gyroscope) and displays by CHAOS (Chapel Hill Astronomical and Observational Society) and RAC (Raleigh Astronomy Club). Free planetarium shows were offered throughout the day as well. The Morehead Planetarium used this as a way to reach out in the community and also say thank you for public support throughout the year.

Press releases indicated that planetarium attendance was up 25% during the past school year and would probably be the highest in the past ten years. The increase was attributed, at least in part, to the fact that programs have been closely aligned to the North Carolina school curriculum.

Pisgah Astronomical Research Institute (PARI), Rosman

We have a new kid on the NC block! Through funding from the Community Foundation of Western North Carolina a large StarLab has been purchased. Bob Hayward, who has been an astronomer/planetarian/administrator at Fernbank

Science Center for over 30 years, has taken the position at PARI to develop outreach programs.

PARI is a public, not for profit foundation whose purpose is to establish and provide an astronomical observatory and study site to be used for education and research by colleges, universities, and K 12 students. It is located on 202 acres in the midst of the Pisgah National Forest on a site that used to be a NASA tracking station and later a DoD facility. Currently two 26 meter radio telescopes are being refurbished.

James H. Lynn Planetarium, Gastonia

Weekend shows for the summer include Sol and Company, The Cowboy Astronomer, and Sky Over Gastonia. In addition, two showtimes are available for group reservations during the week. Bear Tales and Other Grizzly Stories, Sol and Co., and Planet Quest are the programs available to groups.

The Schiele Museum held a Mid Summer Festival on June 16th to celebrate the summer solstice and the 40th anniversary of the museum. This daylong event featured stories and songs by Grammy Award winner, David Holt, as well as, crafts, planetarium shows, and special events in all areas of this unique nature facility.

SciWorks, Winston Salem

The following shows ran during the summer: The Case of the Disappearing Dinosaurs, Mystery of the Missing Seasons, and The Explorers.

Every three months, observing sessions held at Pilot Mountain State Park are sponsored in conjunction with the local astronomy club. On August 11th we observed the Perseids.

Margaret C. Woodson Planetarium, Salisbury

Starry Summers at Woodson Planetarium has returned for its 3rd year. Usually, the planetarium is closed from early June to early August, but each Tuesday morning, staffers come in (on their own time) to do two free public programs. The selection runs from Larry, Cat in Space to Dinosaurs to Bear Tales and Other Grizzly Stories to Constellation Mania (a presenter led constellation identification session). Most of the shows are retired from our school offerings so this is a good opportunity to present different programs. Community

News from SEPA States
continued

Patsy Wilson
Woodson Planetarium
Salisbury, North Carolina

Patsy Wilson
Woodson Planetarium
Salisbury, North Carolina

interest is high, and attendance is good. One show had over 100 visitors in a 75 seat facility.

Joe Hopkins Engineering has recently installed his ScreenMaster PC to replace an aging ScreenMaster system. Lots of hours have been spent transferring cues into the new equipment for all the shows in our library.

This fall we will be stepping gingerly

into the wonderful world of elementary school outreach programs. Two programs, Telescopes and Destination: Moon, have been prepared as options for the staff to enhance space science studies in the classroom. In addition, Our Wonderful Sky from the Sudekum Planetarium will be used with kindergarten visitors.

Glenn Dantzer
Settlemyre Planetarium
Rock Hill, South Carolina

Roper Mountain Planetarium

The big news at Roper is the impending opening of our new building, which will house a new astronomy classroom, a new telescope shop, and a major conference center (an audiovisual facility), and office space. There will also be a Walkway to the Stars which will carry visitors across a new telescope deck on their way to the Daniel Observatory.

Our featured planetarium program is Explorers of Mauna Kea which is currently making the rounds. We are also examining some digital editing/ playback equipment for installation in the next few months.

Settlemyre Planetarium

We here at the Settlemyre are experiencing the back to school rush. We integrated a program for all the fourth graders in the county districts. This proved very successful and we have seen a high number of students.

We are also planning to do the same for eight grade next year. We currently offer eight school shows targeted to different grade levels.

Our weekend programming this fall is Search for Life in the Universe as well as a children's program. The planetarium and observatory project in Columbia is slowly progressing, and I hope to have more news about this exciting project in the next issue.

That's it from South Carolina, and happy holidays to all.

DuPont Planetarium, Aiken

We have another 30 minute show that highlighted the Camera Obscura available at the planetarium and finished with a traditional sky tonight presentation. There is a pinhole at the back of the planetarium that results in an image on the dome depicting what is visible outside of the building. The camera obscura always amazes our visitors, and it is interesting

to observe their reactions as the concept is explained.

Many find it difficult to believe that they are seeing a real image and think we have projected a picture that was taken in the past. We often send someone who is in the planetarium outside of the building to wave at those still inside in an attempt to demonstrate that they are observing a real time image.

In September the planetarium presented The Voyager Encounters; in October, Larry, Cat in Space was presented, and during November, Through the Eyes of Hubble was presented. The month of December is highlighted by the annual presentation of Tis the Season. This show has become an annual favorite with many patrons who make it a main component of their holiday season celebration.

There is still more work to be done on the Observatory that was installed in January 2001 and financed by Bechtel Savannah River, Inc. and the Bechtel Foundation. The telescope mount does not allow observing objects below 30° above the horizon.

During the process of planning to raise the scope, it was determined that the slab under the observatory would not support the extra weight. A structural engineer was working with the project and donating his time to the effort.

Unfortunately, he has moved away from the area, so progress has been slow. We hope to have the telescope on its permanent mount within the next few months.

Fortunately, the telescope is still usable and has been a wonderful enhancement to space science education to the community surrounding the University of South Carolina Aiken.

Sumner Skies Planetarium, Gallatin

Hello, and sorry I haven't reported sooner. I am slowly reactivating my private home built 11 foot dome facility and Home Planetarium Association after a two year hiatus. My primary projection instrument is a 16 inch diameter copper cylinder, hand drilled by Stephen Smith of Douglas Arizona in the 70s, with over 80 individual star lenses. I am, however, retooling the central console and fork in the star chamber to take alternative starballs for variety

and comparison. Chief among these in my possession currently are 1) an original do decahedron from a Spitz A2 projector and 2) my Emmons Starball, hand drilled by Richard Emmons of Ohio. I also intend on demonstrating to my audiences the pros and cons of toy planetarium projectors, ranging from the vintage Spitz, Jr. and Sky Zoo projectors to the ones (mostly awful) found in today's science stores. I typically give shows by appointment to small school and other children's groups.

News from SEPA States
continued

Gary Likert
Sumner Skies Planetarium
Gallatin, Tennessee

Chesapeake Planetarium, Chesapeake

Dr. Robert Hitt, Jr. again says that he is doing lots of school programs. He suspects that it is mainly because of increased enrollment in Virginia Beach schools. He is quite the globe trotter recently. He just came back from a trip to China where he visited the Beijing Astronomical Center. This is one of the oldest observatory sites, established around 1440 B.C. He photographed astronomically themed pottery that was 5,000 years old. He also mentioned seeing many sundials. Bob has also created a very nice calendar of astronomical events as well as one that features the Moon phases. These are handouts for students and teachers. He said he could probably send copies to those who might be interested. Contact him by phone at (750) 547 0153.

of a Trail of Terror ghost walk along our trails, pumpkin carving, Ghost Golf (miniature golf), and a special live planetarium program. We decorated the theater to look like a castle. There a ghost from the Middle Ages was called up to inhabit a suit of armor and tell about the Celtic origins of Halloween. There was trick or treating at each station.

Dave Maness
Virginia Living Museum
Planetarium
Newport News, Virginia

Fund raising continues for a new museum building. Work on the additional trails is complete. Our new additional outdoor aviary is open and includes pelicans for the first time. Work has begun on the new access road for a nearby elementary school. The city will then begin installing the new turning lane and traffic control light.

Visit us at <www.valivingmuseum.org>.

Virginia Living Museum Planetarium, Newport News

At the end of summer, we closed The Mars Show in favor of The Xtra Terrestrial Files. This is an interesting program from the Minneapolis planetarium dealing with the possibility of intelligent life elsewhere in the Universe. Topics covered include the Drake equation, time dilation, and the problems with faster than light travel.

Our third quarterly evening event scheduled for July 20th went over very well. We had full houses for the planetarium program and for the NASA lecture. This year is the 25th anniversary of the landing of Viking on the red planet, so our theme is Mars. Our guest speaker from NASA was Paul Tartabini who gave a very informative and entertaining talk about the red planet.

Instead of a fall astronomy event, we were a part of the Living Museum's second annual Night of the Living Museum Halloween event for families. This consisted

Ethyl Imax Dome Planetarium, Richmond

Eric Mellenbrink says we just opened our new in house production Solar Show room, based on a used star salesman selling a young couple their first used star, which happens to be named Sol. This show will run through January 6. On Friday and Saturday evenings, we continue our Hubble/Night Sky program that looks at the latest Hubble images, and gives a tour of the current night sky. From Jan. 7 Feb. 1 our only planetarium offering will be Hubble/Night Sky along with special school programs. Beginning February 2 we will have a new solar system show.

THE DEADLINE FOR THE NEXT ISSUE OF SOUTHERN SKIES IS JANUARY 1. SEND SUBMISSIONS ON A 3.5 DISK OR VIA EMAIL ATTACHED FILE TO DTEAGUE2@MIDSOUTH.RR.COM OR TEAGUED1@K12TN.NET

Dave Maness
Virginia Living Museum
Planetarium
Newport News, Virginia

Our current feature IMAX film is China: The Panda Adventure. We are also running Journey Into Amazing Caves and Everest once per day through Dec. 30. On January 1 we open Disney's Beauty and the Beast, an expanded version of the classic film that has been digitally enhanced for large format theaters. It will run through spring.

Hopkins Planetarium, Science Museum of Western Virginia, Roanoke

I couldn't reach director Mark Hodges. I believe that, due to budget cuts, the museum is closed on Mondays. I filled out the following information from last time with information from their after hours message.

In the Mega Dome they are showing Lost

Worlds: Life in Balance. Movie showtimes are 1:00, 2:00, and 3:00 on weekends.

The planetarium has regular Saturday morning children's programs at 11:15. A seasonal star show, and a general public program will be announced later.

Virginia Beach City Schools
Planetarium, Virginia Beach

In talking with Dr. Hitt I found out that Herb Teuscher, the Director of the Virginia Beach Planetarium had retired. If I'm not mistaken, he was one of the first members and possibly a founding father of SEPA.

Chuck Dibbs is the lucky man to take his place. He moved from the classroom where he taught mathematics. I told him about SEPA and hope he will send in his membership fee soon.

Elizabeth Wasiluk
Berkeley County Plan-
etarium

Curt Spivey from the Charleston, West Virginia Sunrise Planetarium & Museum was at the SEPA/GLPA meeting, and he sent me the following info on July 2nd via e mail: Construction on the Clay Center continues on time and budget. The concrete is going up fast. The structure should be enclosed by December. Now if we just had parking...

Curt added that things may be crazy for the next year and a half, but invites anyone

in the area to stop down for a visit.

He further mentioned that he conducted an astronomy camp the last week in July for ages 8 - 12. The week culminated on Saturday, July 28 with his summer version of Astronomy Day and a star party from 8 - 11 p.m. If it rained, Curt was planning to premiere More Than Meets The Eye. Now that it is fall, Curt was planning to do a series of evening astronomy classes for adults.

Paul Campbell Fellowship Award Nomination Form

Nominees must have been a member of SEPA for at least ten years, and they must display qualities in each of five areas, as represented by the five pointed, star shaped award: integrity, friendship, service, knowledge, and vision.

Please submit this form to any SEPA Council member.

Nominee's name:

Qualifications:

time was that I could not see a single jet contrail. It reminded me of a section in the book *Lucifer's Hammer* where a character mused that society had come to accept jets as a sure sign of modern civilization. It was ironic that this icon of civilization was used in such an uncivilized act of cruelty. I wondered how long it would be before the jets would return to the skies.

I soon realized that my normal route would put me on roads close to Washington D.C., roads that were likely blocked or diverted. So I decided to make a detour to the west on I 81. This took me into West Virginia where I decided to stop in to see Betty Wasiluk. I needed a chance to talk to a real person about the day's events. It was a lucky coincidence that Betty was close to her phone. Schools had been closed early due to the day's events, and she was in and out running errands. During the tour of Betty's unique facility, she told me of one student who was called out of class because it was known that her father worked at the Pentagon. They were unable to reach either of her parents by phone. As I left West Virginia and headed east, I could not help but think of the school girl who might have lost both parents that day.

Around 9 or 10 p.m. I was on the last leg of my trip, coming in just south of Washington D.C. For the first time all day,

I could see the blinking lights of aircraft. I knew immediately that these were Air Force jets, probably from Langley Airforce Base. This was the first sign I had that civilization was no longer confined to the ground. Later I learned that they were circling the Capitol with orders to bring down any unauthorized planes. It's amazing how important air travel has become in just one century, and how quickly we have accepted it as a normal part of life. It is even more amazing how quickly our perceptions can change.

Even though most of us in SEPA were not directly related to individuals who lost their lives or their loved ones, this event has effected us all and will reverberate for years. How it will effect us, no one knows. There may never be an answer to the ultimate question surrounding the events of this day: why? The individuals involved were likely pawns manipulated through the self-serving misinterpretation of Islamic holy writings, by one man or a small group of megalomaniacs. But I am certain that it has not had the effect that these twisted fanatics likely intended. It has brought us all, Americans and others around the world, a bit closer together and given our countries a common goal to bring those responsible to justice. Along

President's Message
continued

for almost all of the historically important space missions in American history, what do you consider the highlight of your career? Which made you feel that you had accomplished something important? His answer surprised me.

Several events described in the book really had me reading slowly and thinking about what it must have been like to be in his position when they happened. His description of the Apollo 1 fire showed an insider's perspective I hadn't read before. I really felt his pain at the tragic loss of good friends and the difficulty of continuing with what must be done.

The description of the Apollo 11 landing from the earthbound console side was riveting. Mr. Kranz kept great notes and has incredible memory of most of the events described throughout the book. You almost feel a part of the crew staffing the consoles. The level of stress that came with trying to read the information on the monitors that told the status of the spacecraft when the data kept dropping out and you had

to decide whether it was safe to continue the mission or not, can only be compared to running a planetarium show for a full house and the computer automation begins to fail. We might calmly move about and fix things, trying to decide whether to continue the show or stop. Of course a wrong decision in mission control could cost the lives of astronauts. The worst effect of an incorrect decision during a planetarium show would be visitors seeing a bad show. The thing that struck me most was that Gene Kranz was only 35 years old on the day he helped Neil and Buzz land safely on the Moon. My 35th birthday was over a year ago.

Without hesitation, Mr. Kranz answered my question. My answer will probably surprise you. Most folks would think that the first moon landing or the safe return of the Apollo 13 astronauts would be at the top of the list. But I would have to say that the Skylab missions are the highlight. I choose this answer because with those missions we were actually doing work with a long

Failure is not an Option
continued

HST's Greatest Hits of '96

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The Space Telescope Science Institute (STScI) provides slides of Hubble images to individuals within regional affiliates who arrange to duplicate and distribute them. At our '96 conference, I was designated to receive and coordinate STScI materials and make them available to SEPA members.

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| <p>01.a Hubble's deepest ever view of the universe, revealing 1,500+ extremely faint galaxies in various stages of their development</p> <p>01.b Sample galaxies from the same Hubble deep field</p> <p>02 The inner region of a warped dust disk around Beta Pictoris once hidden because of the star's glare</p> <p>03 An image of the Egg Nebula taken by WFPC2; it shows the emergence of mysterious searchlight beams from behind a dying star</p> <p>04 The first direct image of a star other than the Sun: Betelgeuse.</p> <p>05 In more detail than has ever been seen before, the process a star like the Sun goes through when it dies</p> <p>09.a In clear, detailed pictures the first ever images of Pluto's surface; four views</p> <p>09.b Pluto surface map</p> <p>10 Gravitational lens effect captures image of primeval galaxy</p> <p>11 Images of globular cluster Mayall II, consisting of 300,000 old stars, in orbit around the Andromeda galaxy</p> <p>13.a The Helix Nebula, NGC 7293 showing collision of gases near a dying star</p> <p>13.b Helix Nebula detail with cometary knots surrounding the dying star</p> <p>14 A view of Comet Hyakutake that focuses on the near nucleus region of the comet</p> <p>15 Three layers of Uranus's atmosphere</p> | <p>taken with infrared filters; both clear and hazy layers created by a mixture of gases</p> <p>16 Image taken of Saturn where its rings appear edge on because of the position of the Earth in Saturn's orbital plane</p> <p>17 A view of several star generations found in the central region of the Whirlpool Galaxy</p> <p>18.a A rare view of Saturn's rings seen just after the Sun had set below the ring plane</p> <p>18.b A series of 10 images of several small moons orbiting Saturn</p> <p>21.a NGC 1365, a barred spiral galaxy located in the Fornax cluster</p> <p>21.b NGC 4639, a spiral galaxy located in the Virgo cluster</p> <p>22.a The Crab Nebula and a detail of the pulsar in its center</p> <p>22.b Sequence of three images showing changes in the Crab Nebula pulsar</p> <p>23.a Huge, billowing pair of gas and dust clouds in Eta Carinae</p> <p>23.b Expansion of Eta Carinae debris</p> <p>25 Hubble's 100,000th exposure captures an image of a distant quasar</p> <p>27 A vast nebula, NGC 604, which is known for a great starbirth region</p> <p>29.a 18 gigantic star clusters which may be building blocks for a new galaxy</p> <p>29.b Blue sub galactic clumps which may be galaxies under construction</p> <p>30 Jupiter's moon Io passing above turbulent clouds</p> <p>31 Clusters of stars and a fishhook shaped cloud of gases found in NGC 2366, a giant star forming region</p> <p>32 Changes in Jupiter's auroral emissions</p> <p>33 Views of weather on opposite hemispheres of Neptune</p> <p>34 A Martian dust storm around the edge of the north polar cap</p> <p>35.a A survey of quasar host galaxies</p> <p>35.b A quasar caught in the act of colliding with its companion galaxy</p> <p>36.a Supersonic comet like objects in the Cartwheel Galaxy</p> <p>36.b Cartwheel Galaxy composite image</p> <p>36.c Cartwheel Galaxy illustration</p> |
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- | | |
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| <p>01 Central supermassive black holes in galaxies NGC 3377, NGC 3379, and NGC 4486B:</p> <p>03 SN1987A Fireball: One tenth light year long dumbbell structure expanding at six million miles per hour in supernova 1987A</p> <p>08 Changes in the nucleus of Comet Hale Bopp as it moves closer to the sun beginning in September 1995</p> <p>09.a Transition from spring and summer in Mars's northern hemisphere; photo taken shortly before opposition</p> <p>09.b Three photos of Mars taken six hours apart with 90° difference between images; photos taken shortly before opposition</p> <p>11 The Egg nebula in which stars are born and die violently; photo shows jets of gas being blasted into space</p> <p>12 A supermassive black hole located in galaxy M84</p> <p>13 NICMOS captures region of the Orion nebula filled with action as a center for the birth of new stars</p> <p>14 Supernova 1987A: different colors represent different elements in the ring</p> <p>15.a A view of Mars's cloud cover</p> <p>15.b Seasonal changes in Mars's north polar ice cap</p> <p>15.c Four views of Mars rotated 90° between images during summer in Mars's northern hemisphere</p> <p>16 The Cone Nebula: six baby sun like</p> | <p>stars surround their mother</p> <p>17 A collision between two spiral galaxies in the heart of galaxy Arp 220</p> <p>18 Fireworks near a black hole in the core of Seyfert galaxy NGC 4151</p> <p>19 STIS reveals an invisible high speed collision around a supernova</p> <p>20 Hubble pinpoints the optical counterparts of a gamma ray burst in a distant galaxy</p> <p>21 Hubble captures a volcanic eruption plume from Jupiter's moon Io</p> <p>22 A gamma ray burst blazes from a titanic explosion in deep space</p> <p>23 Hubble's look at Mars shows a canyon dust storm, cloudy conditions for Pathfinder's landing in July 1997</p> <p>24.a Dissipation of a large dust storm on Mars</p> <p>24.b Hubble shows dust and water ice clouds exhibit substantial daily variations</p> <p>25 Powerful telescopes discover the largest galaxy in the universe</p> <p>26 Hubble separates components in the Mira binary star system</p> <p>27 Hubble reveals huge crater on the surface of the asteroid Vesta.</p> <p>28 Hubble finds a bare black hole pouring out light.</p> <p>29 Hubble shows blobs of gas formed by some nova outbursts.</p> <p>30 Hubble keeps track of a fading gamma ray burst.</p> <p>31 Mars at the beginning of autumn in the Martian northern hemisphere.</p> <p>32 Hubble sees a neutron star alone in space.</p> <p>33 Hubble identifies what might be the most luminous star known.</p> <p>34.a Hubble reveals stellar fireworks accompanying galaxy collisions.</p> <p>34.b Detailed images of colliding galaxies.</p> <p>35 Hubble shows images of a blue straggler star.</p> <p>36.a Hubble tracks clouds on Uranus.</p> <p>36.b Hubble spots northern hemispheric clouds on Uranus.</p> <p>37 Hubble shows infrared view of moon, ring, and clouds of Jupiter.</p> <p>38.a Hubble sees supersonic exhaust</p> |
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	The entire set of 40 slides is \$50.00, including postage and handling. Send a check or purchase order to the address at left.		to be imaged orbiting about a new born binary star
		20	Four of NASA's proposed designs for the Next Generation Space Telescope (NGST)
01	COBE's infrared view of the Universe: three maps of the full sky seen in infrared light	21	Galaxy NGC 4314: bright ring of starbirth around the galaxy's core
02	Distant supernovae: light sources determine universe's expansion rate	22	NGC7052: galaxy with 300 million solar mass black hole in its center
03	Beta Pictoris: disk indicates planets, possible brown dwarf companion	25	N81 in the Small Magellanic Cloud: a celestial maternity ward
04	Jupiter aurorae: a curtain of light extends several hundred miles beyond Jupiter's limb	26.a	Galaxy Cluster MS1054-03321: thousands of galaxies 8 billion light years from Earth
05	Saturn's aurorae: curtains of light extend 1,000 miles above cloud tops	26.b	Supernova 1996CL: a March 1996 exploding star in galaxy cluster MS1054-0321
08	Supernova 1987A: a collision between the expanding blast wave and circumstellar ring	27	Distant galaxy clusters: left, in Virgo; upper right, in Andromeda; lower right, in Taurus
10	Serendipitous asteroids: HST images show curved trails of asteroids	28	NGC7742: a small Seyfert 2 active galaxy probably powered by a black hole in its core
11.a	Planetary nebula NGC 7027: a brief stage in the evolution of a medium mass star	29	Saturn: pastel yellows, browns, and greys distinguish cloud differences
11.b	Cotton Candy Nebula and Silkworm Nebula: phases of stellar burnout	30	Sagittarius Star Cloud: HST peers into the heart of the Milky Way
12	Star birth in barred spiral galaxy NGC 1808 possibly due to interaction with NGC 1792	31	NGC7635, the Bubble Nebula: an expanding shell of glowing gas surrounding a hot star
14.a	Centaurus A: nearest active galaxy to Earth shows turbulent firestorm of starbirth	32.a	Infrared views: left: faintest galaxies ever seen; right: objects 12 billion light years away
14.b	Centaurus A: tilted disk of gas at galaxy's core surrounds suspected black hole	32.b	Deep field galaxy: left: visible light areas of starbirth; right, infrared disk structure
15	Stingray Nebula: Henize 1357, the youngest known planetary nebula	34	Neptune: a look at the eighth planet's stormy disposition
16	NGC 1818: globular cluster of over 20,000 stars in the Large Magellanic Cloud	35	Uranus, August 8, 1998: its four major rings and 10 of its 17 known satellites; false color
17.a	GRB 971214: gamma ray burst is most energetic event in the universe	36	NGC6210 planetary nebula described as looking like a turtle swallowing a sea shell
17.b	GRB 971214: gamma ray burst; comparison of Keck Telescope and HST views	37	Quasar PG1115+080 and gravitational lens effect:
18	Saturn: details of the clouds and hazes in atmosphere of ringed planet	38	Nebula M1-67 around star WR124: gas ejected into space at 100,000 mph
19	Possible first extrasolar planet ever	39	NGC3132: southern hemisphere's Eight Burst or Southern Ring Nebula
		41.a	HST deep field south: thousands of

JPL '98 Slides

NASA JPL has sent us the following slides for the Galileo Mission and others. Slides are \$1.25 each.

- P 35036B Launch of Galileo on STS 34 Atlantis
- P 35213 Deployment of Galileo and IUS
- P 37218 Venus Colorized Clouds
- P 37327 Moon: Western Hemisphere
- P 37539 Infrared Image of Low Clouds on Venus
- P 37593 Earth: Ross Ice Shelf, Antarctica
- P 37630 Global Images of Earth
- P 40449 Gaspra: Highest Resolution Mosaic
- P 41383 Gaspra Approach Sequence
- P 41432 Moon: North Pole
- P 41474 Earth: Northeast Africa and the Arabian Peninsula
- P 41493 Earth: False Color Mosaic of the Andes
- P 41508 Earth: Moon Conjunction
- P 42501A South Polar Projection of Earth
- P 42964 Asteroid Ida: Five Frames Mosaic
- P 44130 Asteroid Ida: Limb at Closest Approach
- P 44131 Ida and Dactyl: Enhanced Color
- P 44297 High Resolution View of Dactyl
- P 44520 Asteroid Ida Rotation Sequence
- P 44542 Comet Shoemaker Levy 9 Fragment W Impact on Jupiter
- P 47058 Ganymede: Comparison of Voyager and Galileo Resolution
- P 47065 Ganymede: Mixture of Terrains and Large Impact Crater in Unuk Sulcus Region
- P 47162 Full Disk Views of Io (Natural and Enhanced Color)
- P 47179 Three Views of Io
- P 47182 Jupiter's Great Red Spot
- P 47183 Dark Bands on Europa
- P 47194 Live volcano on Io
- P 47196 False Color Great Red Spot
- P 47903 NIMS Ganymede Surface Map
- P 47905 Five Color Views of Io
- P 47906 Europa In Color

- P 47935 Io Glowing in the Dark
 - P 47961 Ganymede's Nippur Sulcus
 - P 47970 Ganymede Color Global
 - P 47971 Io in front of Jupiter
 - P 47972 Changing Volcanoes on Io
 - P 48035 Stereo View of Ganymede's Galileo Region
 - P 48040 Natural and False Color Views of Europa
 - P 48063 Thunderheads on Jupiter
 - P 48112 Ganymede Uruk Sulcus High Resolution Mosaic Shown in Context
 - P 48113 Ganymede Galileo Regio High Resolution Mosaic Shown in Context
 - P 48114 Jupiter's Great Red Spot
 - P 48122 Two views of Jupiter's Great Red Spot
 - P 48127 Ridges on Europa
 - P 48145 Io: Volcanically Active Regions
 - P 48188 The Main of Ring of Jupiter
 - P 48231 Callisto Crater Chain at High Resolution Shown in Context
 - P 48236 Europa: Ice Floes
 - P 48293 Callisto: Scarp Mosaic
 - P 48294 False Color Mosaic of Jupiter's Belt Zone Boundary
 - P 48299 Asgard Scarp Mosaic
 - P 48445 True Color Mosaic of Jupiter's Belt Zone Boundary
 - P 48496 Color Global Mosaic of Io
 - P 48526 Europa Ice Rafts
 - P 48527 Closeup of Europa's Surface
 - P 48532 Mosaic of Europa's Ridges, Craters
 - P 48584 Io's Sodium Cloud
 - P 48698 E4 True and False Color Hot Spot Mosaic
 - P 48700 Jupiter Equatorial Region
 - P 48952 Jupiter's White Ovals, True and False Color
 - P 48954 Ancient Impact Basin on Europa
 - P 48956 Active Volcanic Plumes On Io
-
- P 48439A The Mars '98 Lander
 - P 48440A The Mars '98 Lander
 - P 48494A The Mars '98 Orbiter/Lander
 - P 48495A The Mars '98 Orbiter/Lander
 - P 48567 Dr. Peter Tsou holds Aerogel
 - P 48589 Stardust Spacecraft
 - P 48691 Deep Space 1 Spacecraft

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- 01 M57 Ring Nebula: the sharpest view yet of this planetary nebula
- 02 Combined deep view of infrared and visible light galaxies
- 03 HD 141569: stellar dust rings of a star in the constellation Libra
- 04 SNH1987A: self destruction of a massive star in Large Magellanic Cloud
- 05.a Six images of a young stellar disk found in the constellation Taurus
- 05.b Four images featuring disks around various young stars in Taurus
- 06 NGC 1316: silhouette of dark clouds against a glowing nucleus of an elliptical galaxy
- 07 Mars: visible, infrared light images; evidence of water bearing minerals
- 08 Proxima Centauri: a detailed image of the Sun's nearest stellar neighbor
- 09 GRB990123: fading visible light fireball in a gamma ray burster
- 10 Six images showcasing different views of spiral galaxies
- 12 Tarantula Nebula: multiple generations of stars in the brilliant cluster of Hodge 301
- 13 Jupiter: images of the volatile moon Io sweeping across Jupiter's face
- 14 Copernicus: the 58 mile wide (93 km) impact crater on the Moon
- 16 NGC4650A: a polar ring galaxy
- 18 Rings, arcs, and crosses as seen in

- Hubble's top ten gravitational lens effect images
- 19 NGC4603: magnificent spiral galaxy associated with Centaurus cluster
- 20 NGC3603: various stages of the life cycle of stars in a giant galactic nebula
- 21 AB Aurigae: a swirling disk of dust and gas surrounding a developing star
- 22 Mars: a colossal polar cyclone
- 23 N159: a turbulent cauldron of starbirth in Large Magellanic Cloud
- 25 NGC4414: magnificent details in the dusty spiral galaxy
- 26 NGC6093: a stellar swarm in a dense globular cluster
- 27 Mars: the red planet at opposition during April-May, 1999
- 28 MS1054-03: galaxy collisions in distant clusters
- 29 Jupiter: an ancient storm in its atmosphere (The Great Red Spot)
- 30 Giant star clusters near the galactic center
- 31 HCG 87: a minuet of four galaxies
- 32 HE2 104: small, bright nebula embedded in the center of a larger nebula
- 33.a R136 in 30 Doradus: a grand view of the birth of stars
- 33.b R136 in 30 Doradus: two detailed views of a highly active region of star birth
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NASA JPL has sent us the following slides for the Mars Pathfinder and Cassini/Huygens missions. Slides are \$1.25 each

It's Not Just a Job— It's An Adventure

Kelly Quinn
formerly of the
Bishop Planetarium
Bradenton, Florida

This was originally presented at the joint SEPA/GLPA 2001 conference. Since then, Bishop Planetarium has been destroyed by fire. The future of Bishop Planetarium is uncertain, and astronomy education at the facility has been terminated.

A few short years ago, a curious thing happened. I was looking for direction, yearning for a meaningful career, and trying to find a niche. I looked at the world around me and was amazed. I looked further even than that, and saw an amazing Universe. A voice whispered in my ear, We want you as a new recruit... The slogan read, It's not just a job it's an adventure! Underneath, See the Universe! Who wouldn't be hooked?

I found myself drafted into the ranks of The Planetarians: an elite corps of Professional Educators, Producers, Technicians, Storytellers, Writers, Advocates, Media Consultants, etc... I was about to receive an education, a mission, and a calling.

As with any other elite corps, The Planetarians expect that recruits will undergo some sort of Basic Training an initiation of sorts into the group. A test of character Do you really have what it takes? For, as Helen Keller remarked, No pessimist ever discovered

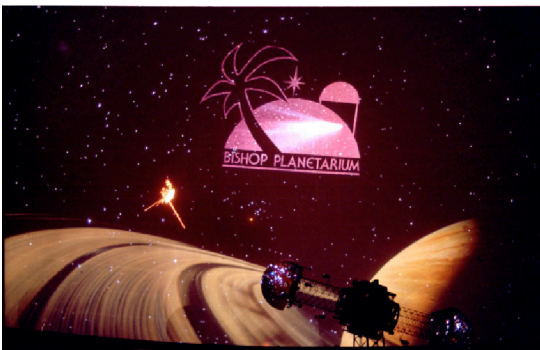
the secrets of the stars... .

As Planetarians, we strive not only to discover the secrets of the stars, but also to share those secrets with others. We want to translate the wonders of the universe from the scientific theories of professional astronomy into a tangible reality that our audiences (whether students, amateur astronomers, or members of the general public) can reach out and touch. We want our audience to feel a connection, to give the heavens above more than just a passing glance, to share some of our enthusiasm for our subject.

Basic Training, for me at least, began with the Jon U. Bell School of Basic Astronomy and Star I.D. Do you remember the first time you tried to point out stars and constellations to an audience? Suddenly, nothing looked like it was where it belonged! I can remember asking Jon, But how do you know that's where it will be?

in all sincerity. If you came to the dome as an already accomplished observer, you might not be able to relate, but if, like me, you had never been inspired to learn the stars and constellations, you'll recall the days when none of them winked Hello, friend! to you and they all appeared randomly jumbled across the sky. Jon replied to my question, Why, because that's where it should be, of course! Now, I can relate more closely to Jon's answer than to my original question; however the price for that jump was hours spent poring over star maps, tracing the constellations on the dome, and observing the real sky outside. A good memory helps, as do some of the common star finding shortcuts (Arc to Arcturus; Follow the Southern Pointers.) but the only way really to know the sky is to spend the time underneath it. Then you really will be able to leapfrog through the constellations.

At least as important as star and constellation I.D. was a basic grounding in astronomy and an ability to translate those grand concepts into ideas to which young students and non professionals can relate. After you master the all important Astronomy 101 quickly followed by Astronomy 202, 303, and so on... , you have to figure out how to communicate what you've learned. Simple analogies and lots of humor go a long way as does action. How many times do you actually ask your audience to do something? Look at the person sitting next to you do you know that they are moving at almost 1000 miles an hour? Rub your hands together and feel the friction. Point to the brightest star you see. Those quick, fast actions are the things that students will remember when they go home. When they return to the planetarium with their families, they'll come and tell you about what they did on their last visit. They may not remember the order of the planets or how hot the surface of Venus gets, but they will remember those actions and some of the science that goes with them. Even better if you can use action to demonstrate some of the concepts that pop up again and again as education standards and goals. Students gain a real appreciation for how eclipses occur, the



Above:
The Bishop Planetarium
logo and their Spitz STP
star projector along with a
Saturn rendezvous scene

reason for the seasons, and how radar mapping works.

Presentation is only half your battle; you've also got to master production techniques so that you can support your presentation with quality visual and audio programming. No matter what size dome with which you are working, you need to be able to present your program to the best of your ability. After all, you want your audience to be amazed by what they see, where you've taken them, and how far you've gone—not amazed by how you've created (or not quite created) something.

One of the first things you need to remember is to use what works for your theater. Even two theaters with similar set-ups will have a different feel. Work with what you have. Instead of trying unsuccessfully to re-create something that you just don't have the capability to do, re-imagine the scene taking into consideration your own special set-up. Your programming should be as unique as your dome.

Next, I've found that it really helps to live the program during production. Take time to listen to the program frequently; yes, you'll get tired of hearing it. Only after you've absorbed the flow of the program, however, will you be able to visualize where and how to use your images, video, and special effects to best match the tone. You'll need to know what's coming up next without having to reach for your copy of the script. Pay attention to those subtle auditory cues—some of the best programming can be done by matching transitions and effects to those cues. Your audience will experience a seamless production without those awkward starts and stops that are so distracting.

To aid you in developing a seamless program, storyboarding is essential. Pay attention to the whole picture and the way the program moves from start to finish. How many times have you decided on a first reading of the script that this will be the perfect showcase for your favorite new special effect? Wait. Don't marry that effect yet! Yes, it may be Mel Gibson with the great behind that you can look at all day, take a cue, however, from the movies. Don't overuse your favorite scene (or effect). Save those scene stealers for just the right time. Flexibility is not just for yoga masters—if something doesn't work, look for alternatives. Mix things up and use the element of surprise. Avoid the temptation to use the same visual patterns over and

over. You want to keep the audience with you, not have them three steps ahead of you anticipating where you're going or three steps behind you wondering where you went and why. Think of your projectors and effects as actors, and imagine that you are staging a scene for them. They all have a specific job, and depending on how you direct them, they can convey different levels of meaning to your audience. I imagine the star projector asking, "But what's my motivation?" as a way to remember to use the actors I use for a reason.

It takes time to produce a program this way. Your reward for all that time and effort is that your audience will walk away after the show without the slightest idea how hard you worked to carry off all those seamless transitions and perfectly staged scenes. That's the way it should be! We're trying to communicate the wonders of the universe, not showcase our special talents, abilities, or effects. If, as Ludwig Mies van der Rohe asserts, "God is in the details," then it's our job to take care of those details so that our audience can see the big picture.

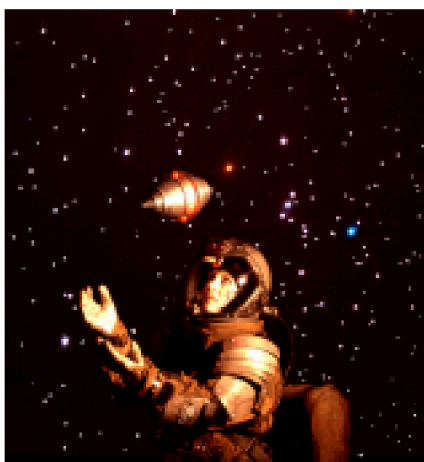
OK, so you've mastered Astronomy 101, learned the sky, and figured out a few things about production—that's it, right? Now you can call yourself a full-fledged planetarian? So many worlds, so much to do. So little done, such things to be, mused Alfred, Lord Tennyson. Such is the life of the planetarian.

One of the vital functions of the planetarium is to serve as a community resource for astronomical events and information. That means you'll be asked to identify meteorites, strange lights in the sky, weather phenomena, and explain the meaning of the Universe on a daily basis. You'll answer phone calls from members of the public concerned about something they observed, school students looking for homework answers and science fair projects, newspaper reporters looking for background information, and amateur astronomers looking for specific expertise in telescope collimation.

You may find yourself fielding calls from special groups who want to use your planetarium as a dramatic backdrop for special events—from sales meetings, to company parties, weddings, even as a futuristic location. We've been host to the local meteorologist for weather reports during meteor showers. This was made easy by the cable connections installed throughout

the facility, including a plug in the outside wall handy for satellite trucks to plug into. We were also featured in a special commemorative magazine celebrating the 2001 Super Bowl held in Tampa: 2001 a Football Odyssey. The producers wanted to create a what the Super Bowl will look like in another century theme and used Bishop Planetarium to show the Galactic game of football being played by players in space suits out among the stars. Publicity and interest like this creates positive community ties and a perception of the planetarium as a dynamic place.

Below: Galactic Football at the Bishop Planetarium



Don't forget to keep your hand in real sky observing. Nothing can ever replace the experience of seeing a celestial object with your own eye underneath the magical dome of night. Go out to a star party or two. It can be intimidating if you haven't had star party experience. If you're not a seasoned observer, you'll most likely hear things you can't explain: What's the difference between Televue and Telrad? Why are all these people trying laser collimation? And just who is the Sky Commander, anyway? All

the participants at a star party are there because they love the nighttime sky and want to share their experience with others. They'll be more than happy to answer your questions, explain the finer points of their favorite type of optics, and swap good views through their scopes. You might even find that you can add to their knowledge because of your comfort with astronomy developed in the planetarium.

Last year at the Winter Star Party, I met an enthusiastic observer who showed off his brand new telescope, outfitted with the finest go-to computer system available. He was very proud and excited of his telescope's abilities and the views it gave him, but he had no idea what he was looking at. At one point, he turned to me and asked, "By the way, what is that cloud that covers the sky right over there?" It was the Milky Way. "Oh," he replied in wonder, "so the Galaxy is actually bigger than the Universe?"

Obviously, there is still plenty of work to be done! Yes, we are in the education business. We can use

Below: Bishop Observatory



tools like the Florida Sunshine State Standards and the National Science Education Standards to promote our programming to teachers and school boards. At Bishop, we've developed a set of pre- and post-visit activities individually keyed to each of our school programs that help promote learning of the specific education standards covered. We also provide teachers with a checklist of the education standards covered by each individual program as an aid in their planning. We want to be seen as teacher-friendly and on the cutting edge of the curriculum needs of the school population we serve. Future plans call for making all these materials available on our Website as PDF documents and expanding the learning standards to cover more curriculum areas such as English, history, and social science.

The goal in creating these resources is to make the planetarium an energetic resource for the entire community and to make learning fun for all. This has been my guide in developing these resources:

- Choose to have fun.
- Fun creates enjoyment.
- Enjoyment invites participation.
- Participation focuses attention.
- Attention expands awareness.
- Awareness promotes insight.
- Insight generates knowledge.
- Knowledge facilitates action.
- Action yields results.

Oswald B. Shallow

When I'm having fun presenting a program, developing an activity, learning more about a subject, or working on a production, I bring my audience along with me to create an enjoyable learning experience. We all get something out of the process, and, more often than not, I am successful at getting my point across, and sometimes even inspiring a deeper interest in astronomy and space science.

It's all about attitude. Each day, I re-enlist in the Planetarium Corps. I bring that enthusiasm and resolve along with me as I strive to learn more, do more, teach more, share more, and touch more lives. This is the same attitude we find in all human endeavors—the same attitude that built, orbited, and continues to construct the International Space Station that we watch pass overhead. It's all up to you to make a visit to your dome an adventure.

Speedy Santa

Have you ever wondered how Santa could travel to each house, slide down the chimney, place the presents under the Christmas tree, and eat the milk and cookies at all of the children's houses around the world in just one night? This can be explained by a few assumptions and some fairly simple arithmetic.

Suppose the world population is about six billion people, and out of those six billion people there are four people in each family. This gives Santa Claus 1.5 billion homes to visit. If Santa spent one second at each home it would take him over 50 years to visit all of the homes.

Santa would have to spend much less than a second at each home in order to make all of the visits in eight hours. To deliver the presents in a single day he could only spend 0.000054 seconds at each stop. In order to deliver gifts to each house in one night—a span I'll estimate at eight hours—he could only spend 0.000018 seconds at each home.

Now that we know how long Santa has to spend at each home, we must find out how fast he must travel to deliver all of the Christmas presents successfully. If we assume that the average distance between each house is about 100 feet, we can figure

out the distance Santa must travel.

If we multiply 1.5 billion homes by the average distance between them, Santa must travel 150,000,000,000 feet. Divide by 5,280 to convert feet into miles, and you will discover that Santa must travel about 30,000,000 miles.

To calculate how fast Santa must fly, we must first find how many seconds are in one evening. There are 60 seconds in a minute and 60 minutes in an hour. If we multiply by eight hours—from bedtime until the children wake up to look under the Christmas tree—Santa has about 30,000 seconds to deliver all the presents.

To find the speed of Santa's sleigh, divide the number of miles (30 million) by the number of seconds (30 thousand.) Santa must travel about 1,000 miles per second.

Since Santa travels so fast, he probably produces enormous amounts of heat due to his friction with air molecules. Santa's sleigh needs a heat shield to protect him from burning. This probably explains why his suit—and Rudolph's nose—are red.

So, this year when you open your presents from Santa on Christmas morning, try to appreciate the time and effort Santa has given to deliver your presents on time.

Rebecca Finley
Senior Intern
Craigmont Planetarium
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The Dragon Ate What?

Improving Girl Scouts Appreciation of Astronomy

April Whitt
Fernbank Science Center
Planetarium
Atlanta, Georgia

When Mitzi Adams called me in January 2001 with the great IDEA of seeking NASA funding for a Girl Scout program, it all seemed harmless. Collect a few dozen scouts and leaders, design some activities, talk to Mitzi by Web in Zambia, and survey the girls for results. Good role models for the girls, good eclipse viewing for us. And the eclipse was months away. What did I know?

I knew that I really enjoy working with Girl Scouts. They're a well organized, generally well behaved and interested group of young women. I'd done numerous programs for their Sky Search badge and was always pleased by the response of both scouts and leaders. And the eclipse was six months and 6000 miles away. The only way I was going to see it was through a program like this one.

The director of the science center agreed to the plan - invite about 60 participants to stay overnight in the planetarium, have the leaders attend two workshops in April and May, study the Sun through some hands on activities in June, take part in the NASA TV broadcast of the eclipse, and all costs would be covered. We would hear if the grant was funded by the first of March.

We didn't hear until nearly the month of April. The leaders were winding down scout programming (It ends pretty much at the same time school does here.), and the pre visit workshops weren't possible. We were late in registering with NASA's Sun Earth Connection Education program so we could access the Webcast. But the interest was still there, and all the participating groups had e mail, so we forged ahead.

Huntsville teacher Elizabeth Simmons and Mitzi Adams wrote up requirements for the special project, and an artist designed an Eclipses and the Sun pin for the scouts to earn. I sent a preliminary pre and post test to them for modification, along with suggestions for activities. A flurry of e mail preceded their departure to Zambia while volunteers here at Fernbank prepared materials. Thank heaven for volunteers!

Scouts and leaders arrived at Fernbank in the late afternoon of Wednesday, June 21st. They stowed their bedrolls in the back rows of the planetarium theater, and we began the festivities there.

I welcomed the scouts and explained that we were starting an experiment. None of us had ever tried anything like this before, and I hoped they would enjoy the event and learn some solar information. For ease of moving groups through the activities, we had prepared buttons in four different colors, one for each of four mythological Sun deities: Ra, Amaterasu, Horus, and Baldur. Scouts selected a button from a bag passed around, and their button color denoted their group.

I gave a brief overview of the evening's activities and handed around star maps for a how to read a star map exercise. The map was from the <www.heavensabove.com> Website, and showed the current evening sky, complete with a predicted bright pass of the International Space Station. I discovered that very few of the scouts in the group had completed the Sky Search badge, so they were able to complete a few more requirements than planned.

The girls and leaders asked good questions during the discussion. We broke for a pizza supper, cleanup, and the pre test. Then scouts assembled booklets they would use during their activity sessions.

There were four stations through which the scouts rotated, with leaders assisting at each one. (If you'd like copies of the worksheets, send me a message at <april.whitt@fernbank.edu> and I'll send one

Right: Scouts used styro-foam balls on sticks and a bright lamp to model solar and lunar eclipses. The umbra and penumbra parts of the shadow worked remarkably well.



along.)

Solar Sleuth was an opportunity for scouts to learn the vocabulary of the Sun and eclipses. They had a scavenger hunt sheet and a list of Web sites to explore, utilizing Fernbank's computer lab. When the hunt was complete, a hidden message could be decoded.

Shadow Spinners concentrated on the geometry of eclipses. Styrofoam balls represented the Earth and Moon, a bright lamp served as the Sun, and scouts worked in pairs to model solar and lunar eclipses. (See facing page photo.) They assembled a diagram of the relative sizes and distances of Earth and Moon on a long strip of adding machine tape.

The Sunspot Cyclists worked on a graph of sunspot activity over 300 years. A small card with a date and the number of sunspots was prepared for each year from 1700 through 2000. The Sunspot Index Data Center in Belgium at sidc.oma.be/index.php3 provided the data for the cards, and a volunteer assembled and laminated a four meter long graph for scouts to chart the data. Washable markers allowed re use of the graph.

Finally, the scouts assembled Moon Masks adapted from Chuck Bueter's paper plate astronomy Web page at analyzer.depaul.edu/paperplate/moon_mask.htm

A giant custom made rubber stamp provided the face image. The creativity exhibited in the construction of Sun and Moon masks, and the demonstrations of eclipses using them, were wonderful.



The Dragon Ate What?
continued

Right: Snacking on the Sun.
Cupcakes were decorated
with prominences, corona
and sunspots.

Several hours were needed to complete all the activities, and we took a break between the third and fourth sessions to gather in the back parking lot to look for the International Space Station. We had viewed a model of the completed station earlier, and discussed how the station is constructed in orbit. Shouts and applause greeted the sighting, and we watched until it disappeared near brilliant Mars, low in the southeast.

After completing the fourth activity, everyone assembled for a snack. Scouts created their own Sun cakes using cupcakes, frosting, and toppings. Candy corn became corona, red licorice strings looped into prominences, and mini chocolate chips served as sunspots. (Apples and bottled water provided a nod to nutrition.)

Because of the relatively crowded observatory (One of the astronomers and a volunteer were taking CCD images of Mars, and there were CCD cables strung everywhere.) the scouts were divided into two groups for observing. One group went up to see Mars through the telescope, while the other made flip books of coronal mass ejections (CMEs). The flip book images are on the Web at www.window.ucar.edu/teacher_resources/flipbooks/cme.pdf

We had them printed in color on lightweight card stock, and AlphaGraphics kindly gave us an educator's discount.

It was well past midnight when everyone was finally ready for bed. The girls and moms spread their sleeping bags on the floor of the planetarium, and we turned down the lights and let the stars slide along in diurn



Left: Masks of Sun and
Moon made another variety
of eclipse model.

Left: Mapping sunspot data from the last 300 years resulted in a graph of sunspot maxima and minima.



nal motion for about 20 minutes. Music and lights were out just after 2 a.m.

Six thirty in the morning came awfully early. Not much rising and shining, but there were a few glimmers. Sleeping gear was packed, belongings gathered, and all yawned through breakfast. NASA TV had interviews with solar physicists and part of the Web cast from the Exploratorium. Their archive site was still up shortly after the eclipse, at <www.exploratorium.edu/eclipse/zambia/museum.html>.

At 8:30 a.m. Mitzi's conference call from Zambia began. Dr. Michael Williams, of the National Society of Black Physicists, arrived to answer the scout's questions and ask some of his own. Excitement grew through the last few minutes before totality, and everyone cheered with the scientists on TV as the corona sprang into view.

Norm Sperling once said all solar eclipses last 30 seconds. No matter how many minutes you have to soak in the sights, to delight in the experience, to yell with enthusiasm it's all over in 30 seconds. Not by the clock, but it did seem about that long. The leaders were even more enthusiastic than the scouts.

Scouts completed a survey from the Sun Earth Connection group, and they received some goodie bags and posters of the Sun. Parents arrived to collect campers, and from the verbal and written comments, everyone thoroughly enjoyed the event.

In brilliant hindsight, I'd do a few things differently next time. I was the only staff member available for the event. Without the help of the scout leaders and parents, I would have been dead before we observed Mars. Make sure there are plenty of helpers before, during, and after the event, and that each knows what to do when.

Meeting with the leaders before the event should be a requirement. Our group was wonderfully flexible and helpful but would have benefited from a tour of the facilities and an overview of the activities before the sleepover, plus some tutoring in the basics of astronomy and eclipses.

Many children this age are in braces. A paring knife was important for those who couldn't bite into apples.

Now, what's this about a Meteors and Comets pin?



Bottom: One highlight of the event was observing Mars through the 36 inch telescope in Fernbank's observatory.

Southern Skies

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FALL 2001

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