

# President's Message

I know everyone who made it to Roanoke agrees with me in thanking once more Gary Close and all the staff at the Science Museum of Western Virginia. You folks showed us a great time!

As always, the vendors whom we depend on to keep our facilities going, voiced their support for SEPA by sponsoring many of the events. I've asked that these folks be recognized with a special thank you elsewhere in this issue.

Thanks also to Jane Hastings, Adam Thanz, Eric Mellenbrink, Dave Maness, and Ken Moore who lent a hand by organizing some of the activities. I hope this spirit of helping spills over to future conferences. We'll look forward to visiting Jacksonville next year.

In case you missed the conference, some important business was conducted. Dues for full members has been increased to \$25 per year. Associate membership remains at \$15. The reason for the difference is two fold.

First, benefits differ from Associate and Full membership, and Council felt this change in dues makes those differences fairer. Second, some folks no longer active in the planetarium but still wishing to maintain their relationship with SEPA asked that we not make dues so high as to preclude their continued membership.

Council thinks that having the Associate Membership level remain the same addressed that concern. Apparently the membership agreed with this assessment, and the changes passed with very little discussion or comment. This is the first dues increase in over 15 years, and the additional funds will enable us to improve membership benefits and undertake some new projects.

Elections were held. John Hare and Duncan Teague retained their positions within SEPA as IPS Representative and Secretary Treasurer respectively. In the race for President Elect the winner was... Dave! Which Dave? Dave Maness of Virginia Living Museum is our newly elected choice.

It was a tough battle, and we appreciate Fernbank's Dave Dundee (aka Commander Daystar) for also being willing to serve this

organization. (Dave, I'm not sure whether that photo being passed around by Betty Wasiluk helped or hurt your campaign, but I now have my own Commander Daystar trading card to cherish forever).

We also voted on the year 2000 conference site. An unusual (well, maybe not by SEPA standards) video and some custom t-shirts with a furry critter emblazoned across the front cinched the bid

for Sci Works in Winston Salem, North Carolina. Duke Johnson and crew promised us more antics when we arrive for the double O conference.

In addition to the usual minutes and reports, we used the remaining business meeting time for an open discussion of SEPA services. A lot of interesting suggestions were put forward, and Council will be discussing these soon. Until next issue (my swan song as President)... may all your Lumilines shine brightly and rain never

Mike Chesman  
President  
Bays Mountain Planetarium  
Kingsport, TN



---

## SEPA's 1998 Paul W. Campbell

---

Eastern Kentucky University's Hummel Planetarium Director Jack Fletcher was named the 1998 recipient of SEPA's Paul W. Campbell Fellowship Award. We hope you enjoyed both your ice cream and your honor, Jack. Congratulations.



# IPS Report

John Hare  
IPS Representative



The 98 IPS conference will forever be warmly remembered by 280 planetarians gathered to discuss issues facing our profession and revel in exciting opportunities afforded by both location and hosts.

On June 25 and 27, IPS Council met. The 26th was reserved for a pre conference trip to Jodrell Bank.

US representatives were in the minority, yet the range of business and concerns were familiar. Issues covered language and communication problems, economic disparities, mission related house keeping, and a myriad other topics. President elect Dale Smith selected Flagstaff as the site for the October 1999 Council meeting, which follows a Phoenix western coalition meeting. Pierre Lacombe detailed the 2000 IPS conference with Montreal's Dow Planetarium as host.

Foremost Council decision was selection of the 2002 conference site. In recent years competition for IPS conference host sites has intensified. Prospective hosts have offered interesting and intriguing invitations. Four such choices were offered, and Council took 2 rounds of voting to select Morelia, Mexico as the ultimate choice over Hawaii, Oakland, and New York.

A particular thrill occurred Friday at the Council meeting at Royal Astronomical So-

ciety Headquarters. During lunch break we were treated to a tour of the facility. Among shelves of original astronomical references from centuries past and antique instruments of famous pioneer astronomers was a small glass case with a four inch section of a branch from Isaac Newton's apple tree! (It lived until 1817.)

The conference itself was interesting and informative. The frantic schedule managed to remain reasonably on time, but there were interludes of more serenely paced activities such as a Thames cruise to the Old Royal Observatory and Planetarium at Greenwich.

SEPA members in attendance were sparse as were others from the U.S. Planetarium shop was spoken in a dozen or more languages as was evidenced by some universally recognized words: Digistar, Spitz, GOTO, etc. IPS Fellow status was awarded SEPA members Dave Hostetter, Gary Lazich, Kris McCall, and Scott Pohl. The accolades didn't stop there. Two Eugenedes Foundation script contest awards went to Jon Bell and Kris McCall. Congratulations to all!

Culmination occurred July 2nd, the day of an optional tour which probably had more delegates in attendance than at the majority of conference sessions over the previous three days. We visited Avebury and Salisbury, and dined in elegance at Wilton House. We spent lingering twilight hours with complete and exclusive freedom to wander, fondle, photograph, meditate,

## Science NetLinks from MCI and

Press Release

Science NetLinks is a project Of MCI and the American Association for the Advancement of Science (AAAS).

Designed specifically for teachers, parents, and librarians, Science NetLinks is a detailed guide to the best science resources on the Internet. Science NetLinks provides information on how teachers can use these sites to make science come alive.

Each month Science NetLinks features a National Science Education Standard

and a Project 2061 Benchmark for Science Literacy. Curriculum Connections details activities and ideas for incorporating the standards into lesson plans for students.

Internet Help provides information and advice on using the Internet in educational activities. Discussion Board lets teachers discuss science education issues/ topics with others from around the world.

Visit Science NetLinks at the Internet address <[www.sciencenetlinks.com](http://www.sciencenetlinks.com)>.

# The State of the Association

SEPA had 89 dues paying members prior to the 1998 conference, and 11 of last year's members paid their dues at the conference. An additional 32 new members joined or former members re joined SEPA in Roanoke.

We send Southern Skies to nine IPS affiliates. Six new sponsors supported the conference this year. Sponsors receive our journal as a benefit of membership. Look for all 15 of the sponsors names and addresses elsewhere in this issue. Thanks go to President Elect George Fleenor for securing such wonderful support for our conference.

We now distribute a total of 147 copies of Southern Skies. It's the largest number since I began serving as editor.

We are also publishing the list of vendors who contributed door prizes to SEPA. There are a whopping 67 different vendors, including some of our own member facilities, who gave us door prizes. Thanks to Adam Thanz for coordinating and soliciting door prizes.

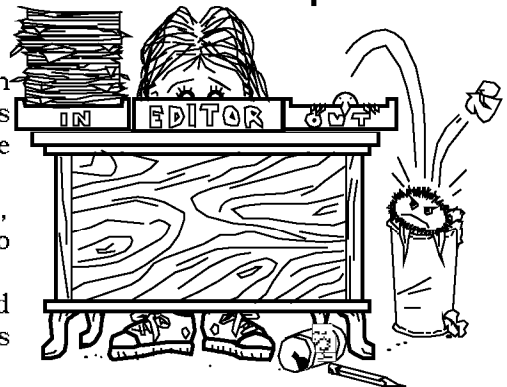
In this issue you will find the list of

slides available for duplication and distribution to SEPA members from two sources. In addition to the STScI images we have received for a couple of years, we now have a relationship with the Jet Propulsion Lab.

We have 66 images from the ongoing Galileo Mission to Jupiter and its moons; one image for the New Millennium Mission, Deep Space 1; two images for the Stardust Mission, and four for the Mars Surveyor 98 Orbiter/Lander. If you would like copies of these images one generation from the originals sent from JPL, see the instructions which accompany the listing.

Aldrin Planetarium Director Erich Landstrom of West Palm Beach, FL has agreed to take over as the Digital Cosmos

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



Mike Cutrera

Send your \$15.00 check made payable to SEPA to the following address:  
Craigmont Planetarium, 3333 Covington Pike, Memphis, TN 38128 3902

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

# Featured Planetarium: Hopkins Planetarium, Roanoke, VA

Dave Hostetter  
Featured Planetarium Ed.  
Lafayette Natural History  
Museum & Planetarium  
Lafayette, LA

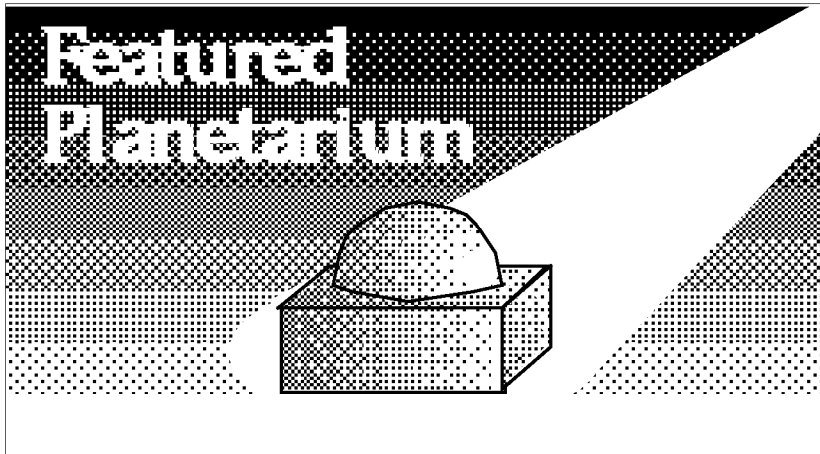
The first home of the then Roanoke Valley Science Museum was 400 square feet in the basement of the Roanoke Fine Arts Center. From here traveling exhibits, such as a stuffed fish and nature related dioramas built from cardboard boxes and

The museum finally had its own home, 3000 square feet in a World War I vintage building with no air conditioning and a sometimes heating system. I joined the local astronomy club shortly after that, and I remember meeting at the old museum on Monday evenings. We sweltered in the summer while a 20" window fan sat on the floor blowing hot air on us.

During the winter the old heating system was turned off each evening to save money, so we froze in the evenings, and the water pipes froze regularly. When the interior office temperature dropped below 32° the staff was dismissed for the day likewise in the summer when the office temperature rose to 95° or above.

The basement was a storage area for discarded commodes from various city elementary schools, so museum supplies were stored in an outside stairwell. A special memory of those days includes the following: when supplies of birdseed were delivered for the annual birdseed sales, the delivery trucks could be observed slowly sinking into the soft asphalt parking lot. It was the La Brea Tar Pits East.

The museum had outgrown its new building. During all this time the state government was enjoying a game of political football over funding for science centers outside the state capital. In the late 60s the Roanoke Valley was proposed as a possible location for a science museum. In



Mike Cutrera

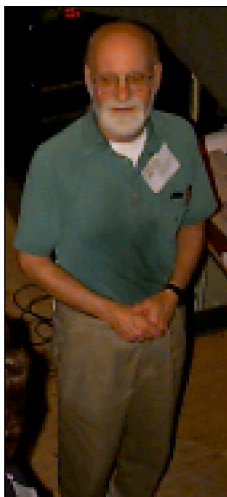
orange crates, were dispatched to local schools. It was 1970, and the organization was then known as the Science Museum Association of the Roanoke Valley.

Gary Close  
Author

Hopkins Planetarium  
Science Museum  
of Western Virginia  
1 Market Square  
Roanoke, VA 24011  
voice 540-342-5717  
fax 540-342-1240  
E-mail: gclose@smwv.org

The new organization was staffed by an eclectic group of local science supporters who served as volunteers. The yearly budget was approximately \$1000. The organization began planning for a much needed expansion. Two years later the museum moved into a carriage house on the grounds of the Fine Arts Center, and the following year hired its first director, Dr. Thomas Krakauer, a former biology professor at Hollins College. Dr. Krakauer's first office was a storage closet in the Chamber of Commerce.

Soon the museum had outgrown the carriage house, and a search was launched for a larger home. Among the candidates considered and declined was a 5000 square foot chicken coop. 1976 the museum moved into the old Tinker Creek School which was leased from the city for \$1.00 a year. The building was renovated by volunteer workers using donated materials and opened with a capital outlay of \$600, \$500 of which paid for a cave exhibit.



1970 an Act of the General Assembly called for setting up a statewide museum system with branches in Tidewater, Richmond, and Roanoke. It was at this time that the local association was formed.

In 1973 the legislature called for not more than one Science Museum. That was in Richmond. Local State Senator William B. Hopkins had advocated a branch system. 1974 Senator Hopkins helped get appropriations for planning a regional museum in Roanoke. Requests and proposals were submitted for \$1 1.5 million plus \$600,000 for a planetarium. No funds were included in the state budget in 1975

76, but Senator Hopkins appropriated \$25,000 per year for operating funds for the small Roanoke museum. In 1978 the state officially removed Roanoke from the state museum list.

1979 the Science Museum Board voted to join the newly conceived combined cultural complex known as the Southwest Virginia Center for the Arts and Sciences and planned to hire Donald Lunetta of Small Moon Enterprises as planetarium consultant and designer. In 1980, thanks to Senator Hopkins, the state appropriated money to be matched locally for building the new Center in the Square. The appropriations included \$1.4 million for a Science Museum and Planetarium. The facility opened in December of 1983 with the newly named Hopkins Planetarium. Probably because of the early troubles with the state legislature the Science Museum of Western Virginia remains fiercely independent, with less than a fourth of its seven figure operating budget coming from the state.

Krakauer and Don Lunetta designed a unique, multi purpose theater that could be used for star shows, concerts, lectures, laser shows, and films. Original equipment included a Spitz 512 star projector and

a 35/70 mm film projector for showing IMAX films, such as Fly. The 40 dome is tilted 42 to allow for projection from the rear, and it is dark grey for maximum color saturation for films.

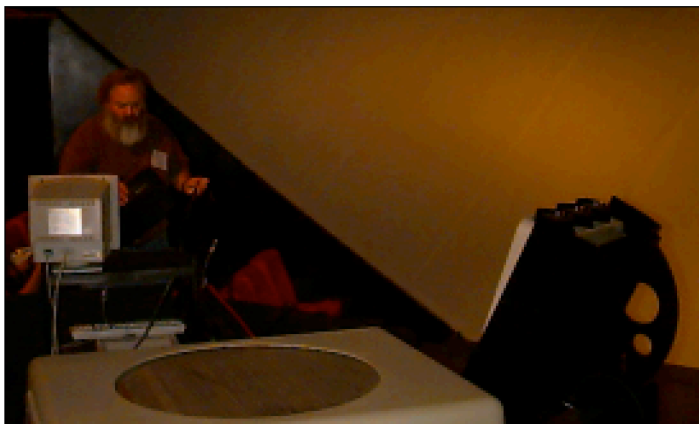
Lunetta incorporated his rather unique slide projection system consisting of a five screen, three deep, portrait orientation pan system centered on the audience s line of sight. This is supplemented with a three screen, three deep, landscape orientation pan system also centered on the audience s line of sight. Each of these systems functions both as pans and screens.

There are eight independent speakers and a subwoofer driven now by a Fostex RD 8 ADAT digital 8 track tape recorder. When the supply of IMAX style films reduced to 35 mm evaporated, the 35/70 film projector was removed. The original AVL slide automation is currently being replaced by Sky Skan. The original Spitz ATM 2 automation is being replaced by East Coast.

By conference time we hoped to have installed a line quadrupled Barco 1209s video projector which will practically fill the 40 width of the tilted dome. We also expected to have our existing line doubled Barco 701s video projector mounted on a tilt pan mount, controlled by Spice, and able to be positioned anywhere on the dome. Video playback will be by three Pioneer laser disk players, one Sony Betacam SP VCR, and one Panasonic S VHS VCR.

Center in the Square is today a unique combination of fine arts museum, regional live theater, history museum, science museum, planetarium, arts council, opera, and ballet. We are housed in a five story building originally built in 1914 and connected by a bridge to a four story building. Also adjoining is a five story parking garage connected on every level with the museums. The whole complex is situated

in the restored downtown City Market area, amid the dozens of Farmers Market stalls, eclectic shops and restaurants that was recently voted one of the 60 best places in America. I hope you got a chance to visit us here at SEPA 98 last June.



# Small Talk

Elizabeth Wasiluk  
Small Talk Editor  
Berkeley County Plan-  
etarium



The first time I heard about Green Bank had to have been in 1977. It was at the Whitworth Furguson Planetarium on the campus of Buff State in Buffalo, NY, only back then it was just plain old Buf State College Planetarium. We were doing a Hansen (the planetarium, not singing group with little munchkins) program (Hey, if you can remember those, you have been around a long time!) called The Loneliness Factor. In it there is a panorama where a lone radio telescope sweeps the sky searching for signals from extraterrestrials, manned by Frank Drake. He, unlike Jodi Foster in Contact, didn't find any signals. Were they still out there? We're still looking, but just 11 years later, it was I standing in front of the real life telescope in that pan.

Before I moved to West Virginia the only thing I knew about the state was that it contained a world class radio observatory

and it seemed like that was more than most West Virginians knew.

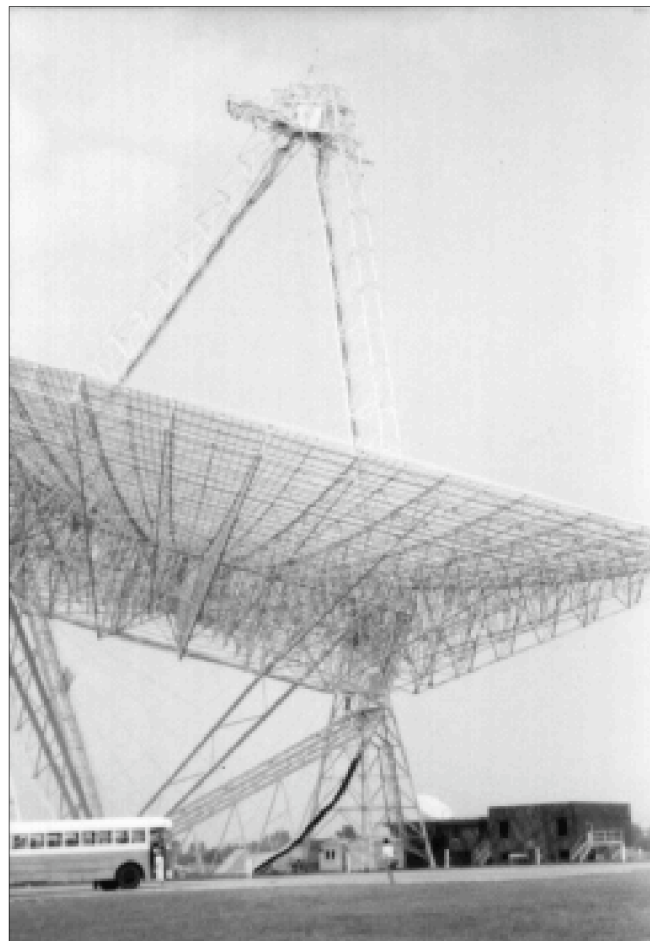
There are fewer and fewer places in the United States that are as isolated as Green Bank, WV. It is a federally designated radio quiet zone, which means, except for one daytime bluegrass station that doesn't carry far, there won't be anything on your car radio as you visit. Forget about TV too.

Though we claim to be amateur astronomers, we are light chauvinists. Unless we can see it, we have a hard time believing that it is really there. But crack open any good science book and you will learn that radio waves take up the largest area of the electromagnetic spectrum and visible light, the smallest area. Should we confine our study of astronomy to visible light, we'll be missing a heck of a lot. Radio astronomy is just one way to study what astronomical objects give off in other wavelengths.

A radio telescope is entirely different

from a visual light telescope. It kind of looks like a satellite dish. The sky in radio would also look different if we had radio eyes. In visible light, to our naked eye, the Sun, Venus and Sirius rank as the brightest objects in the sky. [I think the full Moon is second on that list. Ed.] If we possessed radio eyes, the brightest thing you would see would be a region near the constellation, Cassiopeia, referred to by radio astronomers as Cass A (designation of the brightest radio source in Cassiopeia).

I first got to go to Green Bank in 1988. I had taken a graduate class at Shepherd College from West Virginia University. To keep certification, teachers in West Virginia have to take graduate classes. Since we only have one state university location in Morgantown, WV, the only way grad classes can be offered with in state tuition is to offer them at satellite campuses. Shepherd College in Shepherdstown, WV is one such location. The instructor of the class was Dr. Pat Obenauf.



Right: Before it collapsed in 1988 this 300 foot telescope was one of the largest in the world. Soon it will be replaced by the more modern Green Bank Telescope (GBT).

She just happened to be in charge of running the NRAO summer workshop for teachers, and she plugged it in her class.

The NRAO Summer Teacher workshop was an incredible, intensive workshop which allowed teachers to explore radio astronomy and get to use the radio telescopes, especially a 40 foot radio telescope that was decommissioned and provided for use by teachers and their students. Because the telescope was a transit telescope (It is movable only along the meridian. You have to wait until the Earth's rotation causes what you are looking for to be on the meridian before you can obtain a radio signal from it.), we were getting up at 3:00 a.m. to see Cass A before dawn. Some people joked we had signed up for Astronomy Boot Camp. What better opportunity did we have to interact daily with technicians and astronomers at Green Bank and to get a real feel for what radio astronomers do.

Since then, I have been back to Green Bank for the 30th birthday of the 140 telescope, where we helped show sunspots to visitors visually near the 40 telescope. We got to climb up to the top of the brand new GBT telescope, a revolutionary new radio telescope being built to replace the 300 radio telescope that made national headlines when it collapsed in 1988. (No, it didn't collapse



Left: This 140 foot telescope can track the sky with an equatorial mount. The NRAO staff threw a party for it on its 30th birthday.

because I worked on it.)

The New GBT will look like something out of Star Wars with no side lobes and laser guiding pointer systems.

Since 1987 NRAO in conjunction with West Virginia University has continued to offer summer workshops. The current in-

stallation even has a special component for the older hands like me to get image processing skills.

If you'd like to learn more about the NRAO and their summertime workshops, check out my article in the March 1990 issue of Griffith Observer on pages 2-9, or write or call Dr. Pat Obenauf at 604P Allen Hall, WVU, Morgantown, WV 26506. Call Pat at (304) 293 3442,

Left: The 40 foot radio telescope could be used by anyone trained on it—a great hands-on experience.



# Book Review: A Man on the Moon: The Voyages of the Apollo As-

Patrick McQuillen  
Book Review Editor  
Alexander Brest Plan-  
etarium

There has been quite a bit of focus from Hollywood on astronomy and on the space program in recent months. One of the most eagerly anticipated mini series of late was HBO's *From the Earth to the Moon*. If you have not seen that program, the 12 hours are well worth it. Then again, when you combine HBO

family members of the Apollo astronauts. He interviewed the mission control staff. Just about any individual who might have been connected with the Apollo space program was interviewed. Chaikin's extensive research paid off in the form of a very accurate play by play of each Apollo mission.

Along the way Mr. Chaikin also managed to make the account of the Apollo program enjoyable to read. This is extremely important considering that the book is some 670 pages in length, and that does not include the three page preface by Mr. Hanks. Frankly, the book is just as exciting as the HBO series.

It will definitely take you more than 12 hours to read this piece of literature. You will have a hard time putting down until you are finished too. Nevertheless, even after you finish the book, you will pick it up time and time again to refresh your memory about this or that aspect of a particular Apollo mission. This is easy to do, since the book goes in chronological order. The book also has an extensive index that helps.



A Man On The Moon:  
The Voyages of the  
Apollo Astronauts

Written by Andrew Chaikin

Penguin Books  
New York, New York  
1994, 1998  
ISBN 0-670-81446-6

Revised by  
Patrick McQuillen  
Planetarium Director  
Alexander Brest Plan-  
etarium

Hanks, Ron Howard, and Imagine Entertainment, you are definitely going to get something that is nothing less than spectacular.

The HBO series is based in part (read loosely) on Andrew Chaikin's 1994 book *A Man On The Moon: The Voyages of the Apollo Astronauts*. Chaikin's book has even been re-released this year with a forward written by Tom Hanks as another bit of marketing to promote the HBO series. (The HBO series logo is on the book's cover.) This is one book which should be in everyone's library.

Andrew Chaikin interviewed every Apollo astronaut while he was doing the research for this book. Then he interviewed the



So pick up a copy, and plan to put in some hours reliving one of the most fascinating and exciting adventures in the history of humankind. Then check out the next book, which is the perfect reference for the phone call we all dread. I found a piece of fill in the blank stuff. Is it a meteor? Is it worth money? Can you identify it for me?

Is it just me, or has anyone else noticed society's abnormal fixation with asteroid impacts in recent months? It seems that wherever we turn the evening news, weekly tabloids, prime time

television we are bombard ed (pardon the pun) with the idea that the



# Book Review: Rocks from Space

Earth will be annihilated by some unseen chunk of iron in the not too distant future.

It is during this time that I have had a chance to expand my knowledge about these unseen horrors that Hollywood is so quick to categorize as Death From Above. Enter the well written and compiled book by O. Richard Norton, Rocks From Space.

Although the title may be a bit cheesy, this manual for all would be experts on meteorites is packed with a wealth of information. Best of all, once you have read the book, you will find that it is very well organized a realization you will come to quickly as you refer to it whenever any one calls you with questions about the meteorite that landed in my flowerbed the other night.

Rocks From Space is divided into only a few basic sections. It begins, appropriately enough, in space. You will learn about zodiacal light, interplanetary dust, comets, and meteors. Mr. Norton walks you through the entire process of a piece of infalling space matter.

He also includes a brief interlude with some interesting historical information about meteors and the beliefs surrounding them. (If this discussion is not exactly your cup of tea, Mr. Norton is kind enough to organize the material so that if you skip it, you will not miss anything vital.)

You will track meteorites and craters and then finish off with a discussion about some of our planet's most well known meteorite impact craters.

For those of us who are asked basic meteorite questions on a sometimes daily basis, the introductory section makes for a wonderful reference.

But if you have ever had someone actually bring you a stone and

ask you, "What kind of meteorite is this?" or "How much is this thing worth?" it is the second section that will bring a smile to your face.

The chapters in this section will help you determine whether that darned thing really is a meteorite or not, and if it is, what kind it just might be.

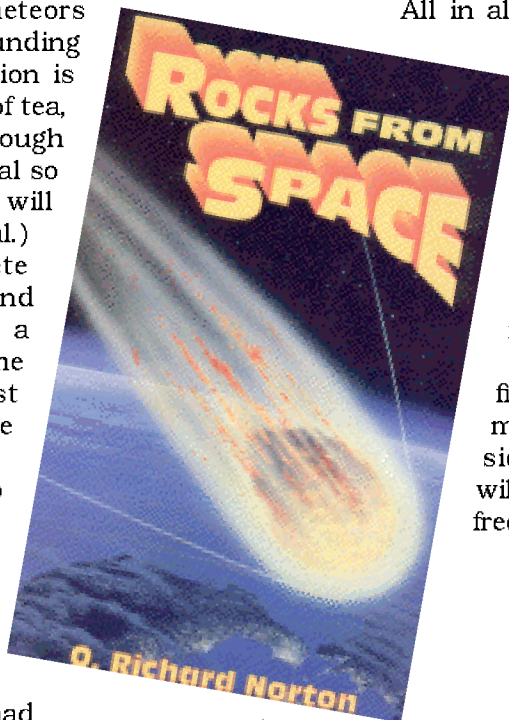
This can also be a lifesaver for you should you ever encounter the person who refuses to believe that his chunk of earth is not a meteorite: You'll see here, sir, that none of the meteorites in this book has a shell imprint in it.

The last two sections of the book lead you through the discoveries of some famous meteorites, the experiences of two well known meteorite hunters, and rockets you through some of the attempts to match meteorites with their asteroid and planetary parents.

My favorite sections, however, were the appendices. I have turned to the Meteorite Verification Laboratories Appendix and the Commercial Meteorite Dealers Appendix quite frequently. There is also an appendix of impact craters on the Earth with the diameters, types of craters, and approximate ages of each.

All in all, the book is very well written. If you happen to have come from a non scientific background, however, you might find some sections of the book a bit drier than I did. The readability is high enough to keep your interest anyway.

I am sure you will find that after only a few months in your possession, Rocks From Space will become dog eared from frequent referrals.



Rocks from Space

Written by  
O. Richard Norton

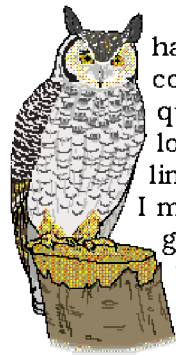
Mountain Press  
Publishing  
Missoula, Montana  
1994  
ISBN 0-87742-302-8

Reviewed by  
Gavin Hoffman  
Planetarium Lecturer  
Alexander Brest Planetarium

# Her Own Space:

## SEPA Souvenirs and Imagery

Barbara Reynolds  
The Night Owl



July, 1998: Writer's block has set in. I'm speechless. My copious notes and quotable quotes notebook has been lost for one month. That's my limit; I'll search no longer. Alas, I must face facts: the notes are gone with the wind, even for the fall edition of Her Own Space.

Staring into space, seated at the keyboard, and days past the deadline, my eyes rest on one of my souvenirs from Roanoke, an empty cardboard carton of Woodchuck Draft Cider lifted from the trash bin. It brings to mind that last Friday night at SEPA 98, the basement bash, a.k.a. the final Hospitality Suite farewell, thanks to Joe Hopkins.

Thinking of these things, suddenly a bulb flashes on. The notes may be gone, but the souvenirs I brought back prove I was there. Surely, a story must accompany both memories and memorabilia from the Virginias. Most SEPAnS have been to those states many times; I had only set foot in Virginia twice before 1998 and never in West Virginia. I'm no spring chicken, either. I was impressed.

I always want to pack up and move to places that I discover for the first time, especially if they are rural and look like a garden, and where the people are gracious and friendly. Roanoke and Green Bank qualify on all counts. I loved the area.

Gary Close and his team, plus the Hotel Roanoke staff, plus the whole town, welcomed us with open arms. The images provided on the Internet by Rovy Brannon (Kelly Planetarium) and Kenneth Moore (Virginia Living Museum Planetarium) were great. The write up on the SEPA homepage (Bays Mountain staff) solidified made tangible SEPA 98.

My words now can only serve to thank again the Hopkins Planetarium for hosting such a memorable conference. One more time: Thank you, Gary Close. Thank you, Hopkins Planetarium staff. Thank you, Science Museum of Western Virginia. Thank you, Roanoke. Thank you, NRAO. And, thank you, sponsors. It was the best

of times.

The following memories are inspired by my ample supply of SEPA 98 keepsakes:

- DoubleTree Chocolate Chip Cookie Bag: What a nice greeting. From the first, southern hospitality was in force. I stayed at less expensive digs, but a friend saved the cookies for me. Yum!
- Swizzle Sticks: That's what I call those plastic stirrers, usually served with big, tropical rum drinks, accompanied by an umbrella. These mementos have the maroon tudor roof logo on them. They will remind me of SEPA 98 comraderie for years to come. The Hotel Roanoke's watering hole had fine drinks, popcorn, and meals. I tried them all out Tuesday evening, before the dome crawl and Pink Floyd. I had a great time but decided that I had better avoid the place the rest of the week! I later found out that they also served coffee (with swizzle sticks).
- Shenandoah Room Graph Notepad: This was a nice touch, and there was even a matching Hotel Roanoke pen. You see, I'm a collector. That's why I enjoy museums. These little souvenirs delight me. I get excited about the smallest things in life. The attention to detail by the DoubleTree didn't go unnoticed. In addition to pad and pen, there were little candy dishes and H<sub>2</sub>O available at all times during the conference.
- Moon Scale Workshop by Mike Chesman: Getting there was half the fun. Why take the elevator when there are stairs? A captive audience, that's why. In the rush to get to Mike Chesman's after lunch workshop, SEPAnS piled into the elevator. Thayne, Duke, and others were talking shop on the way up. I was near the door listening to the discussion of ECCS, UTCS, Sky Skan, etc. I recall a news item from a couple of days before about Luciano Pavarotti—not my favorite tenor—who had appeared in a rock concert in England that week. As the elevator came to a stop, I dropped a one liner on my way out: I'm a Spice Girl, myself. It brought the elevator down, you might say. Escaping the scene, I led the group like the Pied Piper

of Planetarians from the elevator, and all followed me. We were on the wrong floor, but the belly laugh was worth it. The workshop was wonderful. I plan to add Jupiter and Mars for my dark site Nightwatch programs. Let's say some of us are better than others at assembling things, especially sans written instructions. Who reads instructions? I do. I got help from Dwight McGee from Muscle Shoals, Alabama, and some hassling from Duke, but what would one expect? It was a bonding experience.

- **Tabloid Memories: Is The Star a daily or a weekly?** It should only be allowed to publish bi-centennially. Duke Johnson of SciWorks Planetarium presented the mother of all comedy paper sessions. He could be a stand up comedian, and he even had a sidekick/assistant (Sorry, I did not catch her name.) for this 15 minute gut wrenching, side splitting foray into the world of tabloid science.
- **Chemistry In The Planetarium Workshop by Dennis Cowles:** The booklet is a fine handout and shows Dennis dedication; he paid for 20 of them out of his own pocket. The staff at The Louisiana Nature Center compiled the informative material, which saved me from getting writer's cramps. I always feel the need to take copious notes. The workshop was free. The sizzled pickle demo was free. The memory of it lingered awhile in the nostrils of those in the room. You had to be there. Dennis Cowles enthusiasm for his subject is contagious. See his article in this issue of Southern Skies. He never fails to entertain and inform his audience, whether lecturing or using his talent for writing.
- **Green Bank 40 Meter Data Strip:** Adding this to my collection, they assured me, was totally legal. We recorded radio readings emitted from SEPAn's, who went outside and leaned over the edge of the dish. High energy was detected among some groups more than others. No, that was really lightning in the area. Thanks are in order to The Green Bank facility. Sue Ann Heatherlee and staff, especially David, were helpful. I wish I could find the notes to thank the tireless woman in the gift shop. She also did a walking tour and the slide presentation. Pocahontas Library helped with lunch. If I had my missing notes, I could mention other sponsors. The names which come to mind are Sky Skan, Astro Tec,

Zeiss, Omniscan, and Jon Frantz, owner of East Coast Control Systems. The bus ride, breaks, the wonderful ice cream social, and numerous other amenities we enjoyed would not have been possible without them. Murphy's Law dictates that as soon as I mail this article to Duncan, the notes will magically appear. If I have left any sponsors out, please forgive me.

- **Jeff Bowen's Zippered Briefcase:** Thank you for such a nice gift, Jeff. Now, why are my missing notes not in there?
- **NRAO T shirts:** My T shirt with The GBT (Great Big Telescope) no, we know that stands for Green Bank Telescope drew attention, especially when I wore it to Deep Impact and Armageddon.
- **Woodchuck 6 pack:** For newcomers, this one is hard to explain. Kris McCall does it best. Woodchuck Draft Cider Amber was discovered at SEPA '94 in Charlotte. Other inside jokes you may hear about are the Gastonia Seven and the National Museum of Naval Aviation One. I understand he's no longer with us. Well, that's not what I meant to say. He moved on. Be patient; double entendre and private jokes will become clear to you, as you become better acquainted.

It appears the dam holding back the writer has burst. I hope you enjoyed the stroll down SEPA '98 memory lane. If you didn't receive your Members Guidebook, it's because you haven't sent your info to Mike Chesman. It will be updated periodically, and it's a wonderful reference to what's happening in the Southeastern planetarium world. For more information, e-mail Mike at: <bmplanet@tricon.net>. See you all in Jacksonville in 1999 at the Museum of Science and History.

Reminders: Please e-mail any folklore you may care to share regarding your facility and its name to The Night Owl. Some of these tales, if they pass the censor (not sensor), will appear in the Fall 1998 issue of Southern Skies. Please e-mail to: <niteowls@cetlink.net> a.k.a. The Spice Girl.

What's next for SEPA?  
 Jacksonville, Florida:  
 June 22 - 26, 1999 and  
 then Winston Salem,  
 North Carolina: Y2K if  
 the world stays on line,  
 that is.



# News from SEPA States

## Bishop Planetarium, Bradenton

George Fleenor reports The Bishop Planetarium is happy to announce a new Web site and url. The Museum Triplex can be found at <[www.sfmdbp.com](http://www.sfmdbp.com)>.

The outdoor laser show, scheduled for July 4th, was successfully presented without any major problems. A 35 x 35 projection screen was mounted on the 7th floor of the River Park Hotel (next door to the museum) which was used to display graphics, logos and abstract laser imaging. Two 20 watt lasers were also used. One 20 watt was placed on top of the museum, hoisted by crane, the day before the event. The other 20 watt was placed one mile across the river at the Manatee River Grill and Marina. The local rock radio station simulcast the music for the event, which was witnessed by tens of thousands of people. An official estimate of attendees has not been made yet. Based on observations of previous years (for July 4th fireworks), there was at least twice the number of people in attendance this year. The river itself also was filled with hundreds of boaters. The laser company contracted for the event was Peach Tree Laser Inc. from Atlanta. Jim Martin and staff were true professionals and great to work with on this project. Plans have already begun for next year. Yes, we did learn a lot about what we can do to make it better.

As mentioned in a paper presented at SEPA, the observatory is continuing to grow in its capabilities. A 200 watt, wireless microphone system with outdoor speakers has been added, in addition to two 20 x 80 Celestron Binoculars. Permanent mounts for the binoculars are currently on order. The Sky software and encoders have also been purchased, which will be added to the new equatorial mount. A new computer is slated to be ordered in just a couple of days. The observatory should be fully operational, with the new equipment by Autumn in hopes of large crowds for planetary observing sessions.

Currently the starshow Light Years From Andromeda is playing as the matinee starshow, in addition to our evening Skies Over South Florida series. The next public show will open the third week of Septem

ber. It is not known at this time what that show might be. The matinee laser show features the music of Jimmy Buffet in our production of Parrot Head Jam. Our Saturday morning children starshow features Rusty Rockets Last Blast. in July and Larry Cat in Space will be featured in August. Weekly, hundreds of visiting campers view additional educational starshows. These groups can choose between forty different starshows. The South Florida Museum's Space Camp was also a success. Campers learned various astronomical facts, built and launched model rockets, and visited the Kennedy Space Center. The second Space Camp will be held the second week of August.

Several new laser shows have also been added. A new Led Zeppelin, AC/DC, Metallica, Aerosmith, Darkside of The Moon, and Best of Floyd round out the month of August. At this time the planetarium's laser series known as Laser Fantasies, will celebrate eighteen years of continual operation. Boy, we're tired!

Finally, Snooty the manatee, turns 50 years old on the 18th of July. Several thousand people are expected, as usual, to pay tribute to the county's mascot. During the same month, Newton, the new manatee resident, turns 5 years old.

## Buehler Planetarium, Davie

Dave Menke and staff reports his theater has new seats. Ok, they're not new, just recovered (a little rest and a 12 step program). The inmates at the South Dade State Prison did them right quick. The seats were reinstalled in mid June, after the painting. Oh, the painting. You see, we had the ducts cleaned and the insides coated with an antimicrobial paint. And at no extra charge, some paint was dripped on the dome. Also, the contractor had to come back and paint the outside of the ducts black to cover the white sealer around the new cleaning access doors. No one could see why we care about the color of the ducts behind our perf dome.

The starshow, Islands in a Sea of Night will be showing June 26 through Aug. 2, Worlds of Wonder will be showing Aug. 7 through Aug. 30, The Voyager Encounters

George Fleenor  
Bishop Planetarium  
Bradenton, FL

will be showing Sept. 4 Sept. 27, and Rusty Rocket's Last Blast will run June 26 Sept. 27.

Dave Menke returned safely from IPS and reports: It was a great experience. Others can also probably tell you. SEPA members that were there included John & Linda Hare, Jonn and Annie Serrie, James Hooks, David Dundee and family; Gary Lazich from Jackson, MS; Phil Groce from Macon, GA; Jon Bell and family from Ft. Pierce; JoAnne Young from AVI in Orlando, and others that I can't recall right now. Our own Gary Lazich won the International Constellation Shootout. He beat Martin George of Tasmania, Australia, in the final round. George and Alex Barnett were also there; former SEPA region people. Alex made it to the semi finals in the shootout.

Orlando Science Center, The Dr. Phillips CineDome

Paul Trembly reports while they are continuing to run their original production of StarQuest to good crowds, they will be running Larry Cat in Space from Loch Ness in September and January for Preschool month. Early next year, they will open a new show on Saturn and the Cassinii probe. If any one knows of an existing show on this subject please let us know. On other fronts Omniscan laser shows have completed their run and have departed the dome. The imagery of this machine is impressive and filled our 80 dome without any image distortion or significant drop in brightness. And in the silver dome (a.k.a. the Crosby Observatory) we will be offering regular solar viewing on Fridays and Saturdays in both white light and H Alpha starting in July.

Alexander Brest Planetarium, Jacksonville

Patrick McQuillen reports The Alexander Brest Planetarium staff is busy with summer activities. Showing in the Planetarium theater are Rusty Rocket's Last Blast and Summer Skies. Rusty Rocket... (for sale from the Sudekum Planetarium in Nashville) is a children's program about a senior rocket that takes a new class of rookies on a tour of the solar system. This program has been very well received. There are several songs and lots of audience interaction during the program. You have to like a show that has not only the children but also the adults singing the

songs as they leave.

Summer Skies is the standard live tour of the current night sky with the added feature of current astronomy/ space events updates. We have live video feed into the theater of NASA's cable channel, so we keep visitors up to date on current and future Space Shuttle missions.

This is the first summer that we have offered summer camps at the Challenger Learning Center that we manage for the local public school system. They should be an exciting mix of physics, astronomy, Challenger Missions and Chemistry geared at students that have completed the 5th or 6th grade.

Planning for SEPA 1999 is progressing. The dates will be June 22 - 26, 1999. The hotel is most likely going to be downtown within walking distance of the Museum/ Planetarium. This information will be finalized in the next few weeks. Keep an eye on the SEPA Web site for the latest information about the 1999 conference and the Jacksonville, Florida area in general.

The Aldrin Planetarium

Erich Landstrom reports the 1998 Motorola Laser Concert Series at the Aldrin Planetarium has been attended by record audiences. WEAT FM Sunny 104.3 sponsors the daily matinees Laser Kids II and Way Out Rock laser light concerts by JHE, Inc. WKGR FM The Gater 98.7 sponsors weekend evening concerts of Laser Jimi Hendrix and Laser Pink Floyd. During the summer the Aldrin continues its extended schedule with camps in the morning followed by afternoon presentations of DESTINATION: UNIVERSE: Our Future in Space from the Davis Planetarium and our live starshow Night Sky Over the Palm Beaches. DESTINATION: UNIVERSE... reaches its terminus September 7th to be replaced by Galaxies from Hansen Planetarium, which will run until it's time to install the SOB program.

On the drawing board for autumn, there is our Laser Lunacy concert to compliment the Halloween Trail of Terror in Dreher Park; the planetarium Adopt A Star program begins; a possible bus trip to the Kennedy Space Center to see John Glenn's second launch on October 29th; the Leonid meteor shower peak in November and a star party organized by the local astronomy club, the Astronomical Society of the Palm Beaches, to not be held at the Gibson Observatory, but some

News from SEPA States  
continued

George Fleanor  
Bishop Planetarium  
Bradenton, FL

place one can actually SEE the meteors; the Teacher's Guide for 1998-99 must be prepared; and scheduling activities until May 2000 for the next six exhibits: our annual Ocean Encounters, The Magic of Jim Henson, Dinosaurs Outdoors II, Journey to the Heavens, Ocean Encounters again, and STAR TREK: Federation Science.

The Department of Astronomy Education staff is also working feverishly to prepare for the new school year. With the installation of an East Coast Control System, we are combing through the archives

George Fleenor  
Bishop Planetarium  
Bradenton, FL

and putting every pre-purchased, canned show we can in carousels, on ADAT, and through the computer so they are available for school groups during the year. Supplementing our instructional classes, this should triple our program offerings.

Finally, the Aldrin's resident wunderkind Jonathan Swayse is leaving to pursue a degree in computer science from the University of Central Florida. A recent graduate from John I. Leonard High School, the computer technology magnet school, John has been a rising star and we wish him well

Coca Cola Space Science Center, Columbus

The Georgia Association of Planetariums (GAP) will meet on Monday, September 14 from 10:00 a.m. - 4:00 p.m. at the Coca Cola Space Science Center in Columbus. Everyone who works in astronomy education in and around Georgia is invited to attend. Call Tony Butterfield at (706) 649-1470 or <butterfield@planisphere.com> if you are planning to come.

Tony and his staff are currently showing two original productions. Perceptions takes the audience on a journey through the universe. It moves through time from the days of ancient star watchers to the modern day eyes of such technological marvels as the Hubble Space Telescope and Cosmic Background Explorer. Their show Journey to Infinity, narrated by John Delancie (who plays Q on Star Trek), features a trip to the planets and remote galaxies. They also have several laser shows: Laser Beatles, Laser Enya, and Laser U2.

There is an open position at the Coca Cola Center. They are especially interested in anyone who is familiar with Digistars. If interested, send a résumé to Columbus State University.

Savannah Science Center, Savannah

The sad news from Georgia is that the planetarium at the late, great Savannah Science Center has closed and is apparently being demolished. Former director Erich Landstrom has a job at the newly renovated Aldrin Planetarium in West Palm Beach, Florida.

The good news is that there is still some astronomy education going on in StarLab planetariums around the Savannah area. Max McKelvey from the Oatland Island Education Center is even exploring the possibility of getting a new planetarium

Jim Greenhouse  
and Carole Helper  
Mark Smith Planetarium  
Macon, GA

built at his facility.

Another former Savannah planetarium director, Vickie Watson, has been active in the Oglethorpe Astronomical Association. Her group won the national Astronomy Day award for their celebration of the event in 1997 and had another good showing this year. Congratulations to Vickie and all of the others in the association.

Walker County Planetarium, Rock Spring

The building that housed the Walker County Planetarium in Rock Spring has also been torn down. The planetarium, however, is moving seven miles down the road to a new school being built in Chickamauga. Wayne Robinson and Bobby Thompson hope to have the new place running by the spring of 1999.

Wetherbee Planetarium, Albany

Some more slightly sad news: Thomas Finicle is going back to New Orleans where he will be looking for another education job. He developed several new programs and upgraded some equipment during his time at the facility. Tom also participated in astronomical observing sessions at the Indian mounds near Albany. We're going to miss him. His full-time position is being replaced by a part-time, hourly position. The new curator's name is Lisa Lofton.

Fernbank Science Center, Atlanta

The Jim Cherry Planetarium features two original productions. Black Holes: Rivers of Darkness is a look at black holes, white holes, worm holes, and the possibility of parallel universes. A new children's show The Lazy Young Duke of Dundee (I'm sure David had nothing to do with this.), is based on William Wise's children's book.

Jim Guinn from the Denver Museum of Natural History is moving to the Atlanta

area soon and is also looking for a job. If you hear about openings for astronomy educators around Atlanta, please let him know.

**Mark Smith Planetarium, Macon**

We have a new computer, and we are continuing to upgrade our special effects automation, video projection, and sound

systems. Rusty Rocket's Last Blast and WSKY: Radio Station of the Stars are our summer shows. Check out our new Web site at <[www.masmacon.com](http://www.masmacon.com)>.

**Rollins Planetarium, Young Harris**

We offer free planetarium shows to the public on Friday evenings. This summer we are presenting Worlds in Motion.

---

**Freeport McMoran Planetarium and Observatory, Kenner**

Things continue to be frustrating here in Kenner. For those of you who were in attendance at the SEPA conference, you know what I am talking about. For those of you who were not, the city of Kenner continues to have troubles in completing its planetarium project. Instead of beating a dead horse into the ground, I will let you know when something is definitely decided on this project.

Also, our space station exhibit should finally be opening in November. Our very active Young Astronauts Program is currently being prepared. We expect well over 100 participants in this year's nine month program. We are also working with the University of New Orleans in a two week camp called Space Quest in which we provide a field trip and much of the astronomical information and activities provided in this program.

We are currently running Sky Tonight, Bowen's production MoonWitch and Loch Ness's More Than Meets the Eye.

Also, on a personal note, for those of you who missed it, I believe I reached the high point of my professional career when I was quoted in the latest issue of Martha Stewart Living magazine in an article on Summer Stargazing.

When I was first contacted, I thought the article might be on how to coordinate your telescope with your living room curtains.

**Louisiana Nature and Science Center Planetarium, New Orleans**

Mark Trotter and Dennis Cowles are busy as usual with summer programs and trying to recover from the Roanoke conference. For the public they are currently running Sudekum Planetarium's Planet Patrol: A Solar System Stake Out, The Sky Tonight, and The Family Laser Show. For school groups, in addition to the above programs, they run The Little Star That Could and a program about

how lasers work. On Friday and Saturday nights they do laser shows, and the line up includes: Pink Floyd's The Wall, Metallica, Led Zeppelin, Rush 2112, The Best of Pink Floyd, and The Alternative Laser Show. The topical Science Insight programs are still offered the first Saturday of each month at 2 p.m.

Kudos to Gary Close and the staff at the Science Museum of Western Virginia for hosting a very productive conference in Roanoke.

At the time that this is being written, final preparations for Space Exploration Day are underway. Mark and Dennis have planned for special planetarium shows, demonstrations in cryogenics and rocketry by Lockheed Martin Michoud Space Systems, and NASA exhibits. Mark is going to do a special program on the Apollo spacesuit, and a planetarium program on the Apollo Project, discussing the scientific goals of the exploration of the Moon and its historic importance. Dennis is going to have a program on current and future exploration of the Moon and another program on Mars. Jet Propulsion Laboratory has generously donated a Voyager exhibit to the planetarium.

Work is continuing on adding astronomy related programs in the Nature Center classrooms in addition to regular planetarium programs. They are looking around for meteorites for the planetarium collection.

**St. Charles Parish Library Planetarium, Luling**

Here at the planetarium in the swamps of southeastern Louisiana, summer has been bearing down. The heat and humidity are taking their toll on both the air conditioner and the staff. I am happy to report that the library has a new director and the planetarium's star projector should be getting a much needed maintenance overhaul. Between dodging nutria and hurricanes, our scheduled shows are Summer Skies

News from SEPA States  
continued

Greenhouse and Helper  
Mark Smith Planetarium  
Macon, GA

Michael Sandras  
Freeport-McMoran  
Planetarium  
Kenner

Michael Sandras  
Freeport-McMoran  
Planetarium  
Kenner

Duncan Teague  
Craigmont Planetarium  
Memphis, TN

### and The Dawn of Astronomy. Lafayette Natural History Museum Planetarium, Lafayette

David Hostetter reports that the Lafayette Planetarium is getting ready to open Loch Ness Productions Cowboy Astronomer. This presentation will run from July mid October.

Dave also reports that the planetarium will be busy with some workshops for Space Frontiers Week. They will take place the week of July 16-24, the week of the 29th anniversary of the Apollo Moon landing. Programs will deal with space flight,

model rocketry, and a trip to Houston, TX.

In August the planetarium will sponsor several aviation related activities and field trips in conjunction with National Aviation Week.

Dave also reports that some additional meteorites have been secured for the facility's successful meteorites exhibit, and currently he is getting ready for the upcoming school year which will begin in August.

Finally, in September the planetarium will present Sky Tonight presentations and

### Bays Mountain Planetarium, Kingsport

The planetarium at Bays Mountain is currently running an in house production Vision: Imaging the Universe. The show covers our increasing ability to see the universe, beginning with the invention of the telescope, followed by the development of photography and finally through today's electronic imaging with CCD chips. The program is proving popular, with higher than average summer attendance.

Mike and Adam are also being kept busy with Day Campers and numerous special groups. The Park is getting ready to open a new nature classroom building called The Habitat Hub and as part of the open house activities for the public, the planetarium staff assembled a 10 minute spaceship ride that takes place in the planetarium. The

for fun only program, features a jump into hyperspace (courtesy of our new warp drive effect), a descent onto the Jurassic Planet (using laserdisc images of a Pteranodon and T rex), and finally a space battle against marauding UFOs (a la Star Wars). All ends well, and visitors disembark with plenty of time to participate in other department activities.

### Sudekum Planetarium, Nashville

The Sudekum Planetarium has undergone some staff changes since the Spring. Mayra McCloud, Planetarium Production Designer (a.k.a. artist), who joined us in September, 1997, has moved to Washington, D.C. with her husband. This was her first foray into planetariums, and she discovered a whole universe she had never before explored. She is responsible for the artwork in Worlds In Motion and is now looking forward to visiting other domes especially those playing her show.

Robert Rodriguez, half time Planetarium

Technician, has taken a job at Vanderbilt University, which is convenient since there has been some job shuffling throughout the Cumberland Science Museum. Eleanor Williams, who used to maintain the Planetarium and then became a full time Exhibits Technician, will now work for the Planetarium half time and Exhibits half time.

In case you were wondering why a position announcement has not been posted for the graphics opening, Patricia VornDick has moved from the Exhibits department where her position was eliminated to fill the vacancy in the Planetarium. You will get to see her style and talent in the forthcoming production of Lunar Odyssey which focuses on the Moon and will be ready to ship in January, 1999.

In addition to the staff changes, the Science Museum has decided to suspend all outreach programs for the coming fiscal year until they can be more financially sufficient. Regrettably this includes Starlab. Sharon Mendonsa and Waylena McCully, however, will have plenty to do to fill their time: developing new and expanded teacher/activity guides for our programs, presenting programs for camps and facility rentals, and installing several new shows.

Lastly, I have just been informed that Just Imagine, a script written by Philip Groce and Kris McCall, won fourth place in the 1998 Eugenides International Planetarium Script Competition.

### Craigmont Planetarium, Memphis

This summer Spitz is refurbishing all of our console control panels. We look forward to having nice new solid feeling dimmers for the new academic year. JHE will install some upgrades in September.



Chesapeake Planetarium,  
Chesapeake

Bob Hitt reports that his school system theater is closed for the month of July. They will reopen for programs in August. There is a different program each month. Programs are Thursday nights at 8 p.m. They do not charge admission although reservations are required. The program in August is called Planetarium Magic. The September offering will be Meteors and Comets.

Virginia Living Museum,  
Peninsula Planetarium,  
Newport News

The spring rush of school programs is over and now comes the summer rush. Our schedule changes in the summer to include many more public programs. The main summer show is once again The Great Dinosaur Caper: A Mesozoic Murder Mystery.

Show times are 11 a.m., 1:30, 2:30, and 3:30 p.m. The 2:30 p.m. show each day is our live talk about the current night sky called What's Up. A workshop for middle schoolers called Cosmic Questions is scheduled for August. We will also conduct a trip in August to the National Air and Space Museum in Washington, D.C. We call it this our Washington Space Connection.

We are continuing to develop plans for a new 50 foot theater and a new building to house the main exhibits of the Virginia Living Museum. Ground breaking should be within about a year's time, if all goes as planned. We hope to even have space for space related exhibits, that is. That will be a first for us.

Currently the only exhibit space they will allow us is in the entrance way to the theater and the observatory, as well as an occasional temporary exhibit. If you have seen any very good astronomy exhibits recently, I would be very glad to hear about them. We also plan to improve our observatory with particular attention given to disability access.

Science Museum of Western Virginia,  
Hopkins Planetarium, Roanoke

Gary Close reports that they are doing the new Buhl Planetarium show called Comets: From Ice to Fire. That program is going to run through August. Starlit Nights, a show for children will be offered until the fall equinox. Some future shows

will include the following: Worlds in Motion from Sudekum, To Worlds Unknown from the Adler Planetarium, and Destination Mars from Spitz, Inc.

Gary and his staff are gradually recovering from the SEPA conference. He wants to send a big thank you to everyone who participated, especially those who gave of their time to do extra work long before, during, and after the conference. You all know who you are.

Science Museum of Virginia,  
Ethyl Universe Planetarium,  
Richmond

Eric Mellenbrink reports that the Ethyl Universe Planetarium is about to shut down for six months of renovations. The shut down is scheduled for September 8. They are expected to reopen at the end of February.

Renovations will include new seats, a new dome (although the framework will remain), new carpeting, new handrailings, and new aisle lighting.

Until then, the IMax Theater feature film is Everest (which will run through the end of summer. Other film offerings include Alaska: The Spirit of the Wild (It will end August 6.); Storm Chasers (It opens on August 7.), and Destiny in Space.

Planetarium programs will include Jeff Bowen's production called Lifestyles of the Stars. A live presentation which will change every two months is called The Night Sky. This program is also shown daily.

These programs will all continue up until the closing for renovations in September. About the end of February they will reopen with the films Grand Canyon and Whales. At that time, the planetarium show will be The Night Sky.

News from SEPA States  
continued

Dave Maness  
Peninsula Planetarium  
Newport News, VA

THE DEADLINE FOR THE NEXT ISSUE  
OF SOUTHERN SKIES IS OCTOBER  
1. SEND SUBMISSIONS ON A 3.5  
DISK OR VIA EMAIL ATTACHED FILE  
TO STARMANTNG@AOL.COM OR  
TO TEAGUED1@TEN.NASH.TEN.K12.

# 1998 Door Prize Contributors for the Roanoke conference

---

AIMS Multimedia  
9710 DeSoto Avenue  
Chatsworth, CA 91311 4409

Aldrin Planetarium  
4801 Dreher Trail North  
West Palm Beach, FL 33405

ARC Science Simulations  
P. O. Box 1955S  
Loveland, CO 80539

Ash Enterprises  
3602 23rd Avenue West  
Bradenton, FL 34205 2132

Astro Tec Manufacturing, Inc.  
231 Locust St.  
Canal Fulton, OH 44614

Astronomical Data Services  
3922 Leisure Lane  
Colorado, CO 80917 3502

Bays Mountain Park Planetarium  
853 Bays Mountain Park Road  
Kingsport, TN 37660

Big Bang Brewery  
650 Fifth Street, Suite 403  
San Francisco, CA 94107

Bishop Planetarium  
201 10th Street West  
Bradenton, FL 34205

Bowen Productions  
748 East Bates Street, Suite 300 W  
Indianapolis, IN 46202

Celestial Products, Inc.  
P. O. Box 801  
Middleburg, VA 20118 0801

Cosmos Research  
P. O. Box 8110 711  
Blaine, WA 98231 2107

Cotton Expressions, Ltd.  
325 North Bell Avenue  
Chicago, IL 60612 2252

Craigmont Planetarium  
3333 Covington Pike  
Memphis, TN 38128 3902

David Chandler Company  
P. O. Box 999  
Springville, CA 93265

DK Multimedia  
95 Madison Avenue  
New York, NY 10016

Dobson Astro Initiatives  
P. O. Box 460915  
San Francisco, CA 94146 0915

East Coast Control Systems  
P. O. Box 486, Main Street  
Bigler, PA 16825 0486

Edmund Scientific Company  
101 East Gloucester Pike  
Barrington, NJ 08007 1380

Evans & Sutherland  
600 Komas Drive  
Salt Lake City, UT 84018

Farrier Software  
1518 Main Street  
Louisville, CO 80027

Fernbank Science Center  
156 Heaton Park Drive NE  
Atlanta, GA 30307

Films for the Humanities & Sciences  
P. O. Box 2053  
Princeton, NJ 08543 2053

Finley Holiday Film Corporation  
12607 E Philadelphia St, P. O. Box 619  
Whittier, CA 90601

Flagship Carpets, Inc.  
P. O. Box 1189  
Chatsworth, GA 30705

Full Compass  
8001 Terrace Avenue  
Middleton, WI 53562

Galactic Attic  
1102 Dartmouth Street  
Chattanooga, TN 37405

GOTO Optical Mfg. Co.  
12 Champagne Drive  
Nashua, NH 03062

Hopkins Planetarium  
1 Market Square  
Roanoke, VA 24011

International Laser Display Association  
4301 32nd Street West, Suite E  
Bradenton, FL 34205 2132

Interstellar Illustrations  
2403 West Friday Circle  
Cocoa, FL 32926

Joe Hopkins Engineering  
4301 32nd Street West, C 1  
Bradenton, FL 34205

Kalmbach Publishing Company  
21027 Crossroads Creek, P. O. Box 1612  
Waukesha, WI 53187

Kensington House  
Mid Atlantic Starlab  
40 Cameron Ave.  
Somerville, MA 02144

Laser Images, Inc.  
6911 Hayvenhurst Ave.  
Van Nuys, CA 91406

Light Impressions Corporation  
439 Monroe Avenue, P. O. Box 940  
Rochester, NY 14603 0940

Loch Ness Productions  
P. O. Box 1159  
Groton, MA 01450

Lumicon  
2111 Research Drive, #5 S  
Livermore, CA 94550

Mark Mercury  
1307 N. Lincoln Ave.  
Pasadena, CA 91103

Mark Smith Planetarium  
4182 Forsyth Road  
Macon, GA 31210

Meade Instruments Corporation  
6001 Oak Canyon  
Irvine, CA 92620

Minolta Corporation  
100 Williams Drive  
Ramsey, NJ 07446

Mountain Press Publishing Company  
1301 S 3rd St. W  
P. O. Box 2399  
Missoula, MT 59806

Naturegraph Publishers, Inc.  
3543 Indian Creek Rd  
P. O. Box 1075  
Happy Camp, CA 96039

Orion Telescope Center  
P. O. Box 1815  
Santa Cruz, CA 95061

Pangolin Laser Software  
10114 Lavender Flower Court  
Manassas, VA 22110

Project Pluto  
168 Ridge Road  
Bowdoinham, ME 04008

Rivers Camera Shop  
454 Central Avenue  
Dover, NH 03820

Robert J. Resetar  
P. O. Box 23528  
Minneapolis, MN 55423

Roger W. Tuthill, Inc.  
11 Tanglewood Lane  
Mountainside, NJ 07092 0086

Sarasota Camera Exchange  
1055 South Tamiami Trail  
Sarasota, FL 34236

Scott Electric  
1000 South Main Street  
Greensburg, PA 15601 0526

Sky Publishing Corporation  
P. O. Box 9111  
Belmont, MA 02178 9111

Sky Skan, Inc.  
51 Lake Street  
Nashua, NH 03060 4513

Software Bisque  
912 12th Street, Suite A  
Golden, CO 80401

Space Craft International  
P. O. Box 61027  
Pasadena, CA 91116 7027

Space Telescope Science Institute  
3700 San Martin Drive  
Baltimore, MD 21218

Spitz, Inc.  
P. O. Box 198  
Chadds Ford, PA 19317 0198

Springer Verlag New York, Inc.  
175 Fifth Avenue  
New York, NY 10010 7858

Sudekum Planetarium  
800 Fort Negley Boulevard  
Nashville, TN 37203

Technical Innovations, Inc.  
22500 Old Hundred Road  
Barnesville, MD 20838

The Sky Is Falling  
1501 Broadway, Suite 1304  
New York, NY 10036

Ultimax Group  
112 Mason Lane  
Oak Ridge, TN 37830 8631

Universal Workshop  
Furman University  
Greenville, SC 29613

Lawrence Hall of Science  
University of California, GEMS  
Berkeley, CA 94720 5200

Ursa Major  
695 Mistletoe Road #2, Box 3368  
Ashland, OR 97520

Zephyr Services  
1900 Murray Avenue, Dept. A  
Pittsburg, PA 15217

# HST's Greatest Hits of '96

Duncan Teague  
 DT Publishing  
 3308 Bluemont Drive  
 Memphis, TN 38134-8454

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.

Below you'll find a brief description of all 40 images distributed in 1996. Numbers next to the descriptions are shortened versions of STScI press release numbers, e.g., 21a refers to PR 96 21a.

The entire set of 40 slides is \$50, including postage and handling. Send your check or purchase order to the address at left.

- |  |   |
|--|---|
| <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 NGC2366, 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> |
|--|---|

# HST's Greatest Hits of '97

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.

Below you'll find a brief description of all 40 images distributed in 1997. Numbers next to the descriptions are shortened versions of STSci press release numbers, e.g., 09a refers to PR 97 09a.

The entire set of 39 slides is \$48.75, including postage and handling. Send a check or purchase order to the address

01	Central supermassive black holes in galaxies NGC 3377, NGC 3379, and NGC 4486B:	17	stars surround their mother
03	SN1987A Fireball: One tenth light year long dumbbell structure expanding at six million miles per hour in supernova 1987A	18	A collision between two spiral galaxies in the heart of galaxy Arp 220
08	Changes in the nucleus of Comet Hale Bopp as it moves closer to the sun beginning in September 1995	19	Fireworks near a black hole in the core of Seyfert galaxy NGC 4151
09.a	Transition from spring and summer in Mars's northern hemisphere; photo taken shortly before opposition	20	STIS reveals an invisible high speed collision around a supernova
09.b	Three photos of Mars taken six hours apart with 90 degree difference between images; photos taken shortly before opposition	21	Hubble pinpoints the optical counterparts of a gamma ray burst in a distant galaxy
11	The Egg nebula in which stars are born and die violently; photo shows jets of gas being blasted into space	22	Hubble captures a volcanic eruption plume from Jupiter's moon Io
12	A supermassive black hole located in galaxy M84	23	A gamma ray burst blazes from a titanic explosion in deep space
13	NICMOS captures region of the Orion nebula filled with action as a center for the birth of new stars	24	Hubble's look at Mars shows a canyon dust storm, cloudy conditions for Pathfinder's landing in July 1997
14	Supernova 1987A: different colors represent different elements in the ring	24.a	Dissipation of a large dust storm on Mars
15.a	A view of Mars's cloud cover	24.b	Hubble shows dust and water ice clouds exhibit substantial daily variations
15.b	Seasonal changes in Mars's north polar ice cap	25	Powerful telescopes discover the largest galaxy in the universe
15.c	Four views of Mars rotated 90 degrees between images during summer in Mars's northern hemisphere	26	Hubble separates components in the Mira binary star system
16	The Cone Nebula: six baby sun like	27	Hubble reveals huge crater on the surface of the asteroid Vesta.
		28	Hubble finds a bare black hole pouring out light.
		29	Hubble shows blobs of gas formed by some nova outbursts.
		30	Hubble keeps track of a fading gamma ray burst.
		31	Mars at the beginning of autumn in the Martian northern hemisphere.
		32	Hubble sees a neutron star alone in space.
		33	Hubble identifies what might be the most luminous star known.
		34.a	Hubble reveals stellar fireworks accompanying galaxy collisions.
		34.b	Detailed images of colliding galaxies.
		35	Hubble shows images of a blue straggler star.
		36.a	Hubble tracks clouds on Uranus.
		36.b	Hubble spots northern hemispheric clouds on Uranus.
		37	Hubble shows infrared view of moon, ring, and clouds of Jupiter.
		38.a	Hubble sees supersonic exhaust

Duncan Teague  
DT Publishing  
3308 Bluemont Drive  
Memphis, TN 38134-8454

# JPL '98 Slides

Duncan Teague  
 DT Publishing  
 3308 Bluemont Drive  
 Memphis, TN 38134-8454

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

# Astro-Video Review: Cathedrals of the Sky

I asked Duncan Teague to review this videotape he received as a door prize at the Roanoke conference. Mike Chesman

I was prepared not to like this video due to its \$149 price tag compared with others from the Discovery Channel that cost \$29.95 or less. I wound up liking it, not for academic reasons but for personal ones.

The introduction asks age old questions that sound as much philosophical as they do scientific: How did the universe begin? How did we get here? Why are we here? The techniques and equipment used to answer these questions are the subject of this story the Earth's great astronomical observatories cathedrals of the sky. Most of the photographs used to illustrate this introduction are, ironically, from the Hubble Space Telescope, not from our ground based, earthbound observatories.

The first scene explains the break through discovery by Edwin Hubble that many spiral nebulae are not part of our galaxy but are external to the Milky Way. The Father of Modern Cosmology, working with the 100 inch telescope of the Mt. Wilson Observatory in California, used an October 6, 1923 photograph of a Cepheid variable star in the nearby Andromeda Galaxy as a cosmic milepost to determine our distance from that galaxy.

The period of variability of a Cepheid variable tells astronomers its intrinsic brightness. When astronomers compare a star's absolute magnitude with how bright it appears to be its apparent brightness they can calculate the star's distance from us.

Astronomy videos usually appeal to me because of my professional interest in the subject. I found personal satisfaction an emotion I didn't expect to experience from a documentary in a scene about Galileo's use of a telescope as a tool for observation.

The Catholic Church drove a wedge between science and religion by forcing Galileo to recant politically insensitive statements that Earth was not the center of the universe. A Jesuit priest doing research at Vatican Observatory explains, Whenever we have an apparent conflict

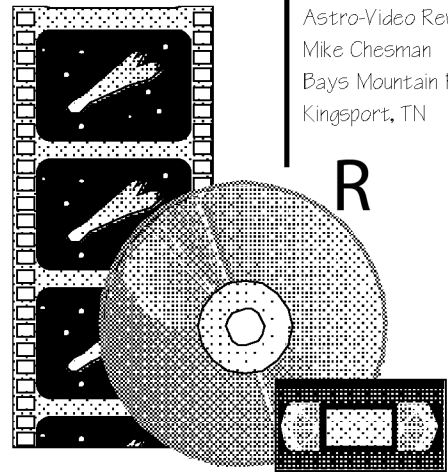
between faith and technology, it's usually the result of ignorance, either on the part of religion or science or both.

Today's Catholic Church has chosen astronomy as the conduit for reconciling matters of faith and science. Today when science tells us something that appears to be in conflict with church teachings, the scripture is reviewed and re-examined in a search for alternate explanations for what the writer may have meant. I found this idea very gratifying and reassuring. I like knowing my church is able to adapt to new scientific developments.

The video follows technological improvements so astronomers can, ... see more ... and go beyond what has been possible. We witness through old news clips the construction, transportation, grinding, and polishing in the 1930s and 40s of the 200 inch mirror at Palomar Observatory. We see two different current approaches for gathering more light and improving the seeing of telescopes: single mirror telescopes like the new 8 meter Gemini and segmented mirrors like the 10 meter Keck in Hawaii. We witness live discoveries and hear the grand statement that surface observatories and the Space Telescope work in concert with each other, the former providing us with subtle details, the latter giving us outstanding clarity.

The pace is comfortable, and a good mix of interviews, animation, and on location shots keep the viewer's interest. The 58 minute video is high quality, but the sound is a little low in volume. Narration is crisp and easy to understand. The story flows well. The viewer participates in the excitement of new discovery as it happens.

The only problem I see is a steep price tag of \$149, but a customer sales representative explained to me that figure also includes public performance rights. Call



Astro-Video Review Editor  
Mike Chesman  
Bays Mountain Planetarium  
Kingsport, TN

Reviewed by  
Duncan Teague  
Craigmont Planetarium  
Memphis, TN

# Orbital Mechanics of Ice Ages

Dennis Joseph Cowles  
Louisiana Nature and Science Center  
New Orleans, LA

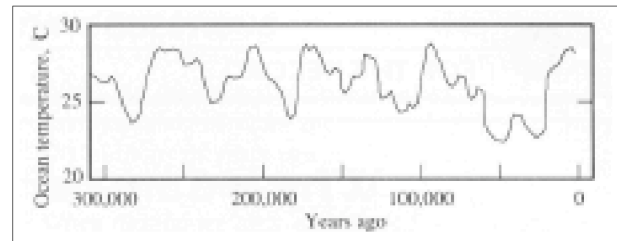
In the planetarium, I like to highlight the unseen connections between seemingly unrelated things. One such connection is between Earth's climate and its orbit. During several periods of Earth history, vast sheets of ice spread themselves across many thousands of square kilometers. In some cases, these ice sheets persisted for thousands of years. Why do these ice ages occur? Why do they end? A Yugoslavian civil engineer named Milutin Milankovich provided a key hypothesis in the early part of this century that neatly explains how and why ice ages occur. This hypothesis links ice ages to Earth's orbital mechanics. Before launching into a discussion of the Milankovich hypothesis, however, I would like to examine how we know that ice ages have occurred in the first place.

Geologists can determine when an ice age occurred by examining marine sediment cores. In those cores are found tiny shells from minute marine organisms called foraminifera (forams, for short); the shells are made of calcium carbonate ( $\text{CaCO}_3$ ). When forams die, those shells fall to the bottom of the ocean and become incorporated into sediment layers. The calcium carbonate that forams use to make their shells comes from the ocean, and the oxygen in those shells provides us with valuable information.

Oxygen comes in two common isotopes, oxygen 16 ( $^{16}\text{O}$ ) and oxygen 18 ( $^{18}\text{O}$ ). There is no chemical difference between the two, only a slight difference in mass.  $^{18}\text{O}$  is slightly heavier. The ratio of  $^{18}\text{O}$  to  $^{16}\text{O}$  is essentially constant in sea water. When an ice age occurs, though, large amounts of water are bound up in the ice, and the sea level drops. Something more important happens, too—the ratio of  $^{18}\text{O}$  to  $^{16}\text{O}$  changes. Since  $^{18}\text{O}$  is heavier than  $^{16}\text{O}$ , water that contains  $^{18}\text{O}$  evaporates at a slightly lower rate than water which contains  $^{16}\text{O}$ . Under normal circumstances this doesn't matter because there is so much water available that the preferential loss of  $^{16}\text{O}$  from evaporation isn't noticeable. When an ice age occurs, however, preferential evaporation does become noticeable and

geologists can measure changes in  $^{18}\text{O}/^{16}\text{O}$  ratio by analyzing the chemistry of foram shells.

If the ratio of  $^{18}\text{O}$  to  $^{16}\text{O}$  increases in a particular sediment layer, an ice was occurring at the time that the sediment layer was created. From the oxygen isotope ratio, geologists can estimate the amount of ice that must have been present to account for



the observed amounts of  $^{18}\text{O}$  and  $^{16}\text{O}$ , and from that they can infer the temperature of the oceans as a function of time. Thus, we can not only determine when past ice ages have occurred but also determine the temperature of the oceans.

The graph of ocean temperature vs. time is shown in the figure. (The figure was taken from *Worlds Apart: A Textbook in Planetary Sciences*, by Guy Consolmagno and Martha Schaeffer.) It seems to be periodic. That is to say, it seems to exhibit some kind of rhythmic or cyclical pattern. Milutin Milankovich examined the question of orbital control of climate in the 1920s. He hypothesized that periodic changes in the orbital properties of the Earth were the cause of the ice ages. In the 1950s, scientists examined the oxygen isotope chemistry of foram shells and developed the ocean temperature curve. This curve was analyzed to see whether there were any recurring periods contained within it, through a mathematical technique known as Fourier analysis.

Fourier analysis can be used to decompose a curve into an infinite series of sine and cosine functions—any curve can be decomposed this way. This technique is very useful in physics and other sciences. For example, applying Fourier analysis to the curve of a planet's gravitational potential tells us how mass is distributed inside the planet and whether there is a core. The



application of Fourier analysis to the ocean temperature curve showed that it could be seen as the sum of three sine functions. The sine functions have periods of 105,000 years, 41,000 years, and 23,000 years. Each of these periods is astronomical in nature, and each is related to the Earth's orbit and orientation in space. It seems that Milutin Milankovich was right.

The period of 105,000 years is linked to changes in the Earth's orbit eccentricity. The eccentricity of orbits changes through gravitational pull by other bodies. In the Earth's case, the other bodies are the planets. Earth's orbit varies from being nearly circular to pretty eccentric. The period of this eccentricity change is 105,000 years. The variation in eccentricity determines how far Earth gets from the Sun. When Earth is closer to the Sun, more solar energy falls on the planet. The temperature is higher. The reverse is also true: the farther Earth is from the Sun, the colder it is. Presently our orbit is pretty circular, so there's not much difference. (There is some difference. Earth is closest to the Sun in January. Summer in the southern hemisphere is slightly hotter than summer in the northern hemisphere.) This effect becomes more pronounced when the eccentricity is large. Right now the difference between Earth's aphelion and perihelion distances is about 3.1 million miles. This difference is slight compared to the size of one astronomical unit—a difference of some 3.5%. Since the amount of radiation received is inversely proportional to the distance, this doesn't amount to much. It is noticeable, however. Pick two cities at similar latitudes north and south of the equator. Monitor the average temperatures for about a year. Determine the average temperatures by season. (And remember that they are reversed for the southern hemisphere.) You should find that the temperatures for the southern hemisphere are a bit hotter during the summer and a bit cooler during the winter. The difference is due to the eccentricity of the Earth's orbit. Another way to check this is to find a city near the equator to monitor. The months of December–February are the hottest months of the year. (These would make nice activities for high school students. Hint! Many newspapers list high and low temperatures for cities around the world, so it should be pretty easy to collect the data.)

The eccentricity of Mars is much higher

than for Earth ( $\epsilon_{\text{Mars}} = 0.094$ ). We would expect that there would be a considerable difference in temperature between the hemispheres for corresponding seasons. This turns out to be the case. The difference between Mars's aphelion and perihelion distances is 26.6 million miles. This represents a sizable fraction of the total size of the orbit of Mars—almost 19%. Mars shows marked seasonal differences between its northern and southern hemispheres.

The second period, 41,000 years, is Earth's nutation period—the amount of time that it takes for Earth's axial tilt to go from its minimum (21°) to its maximum (24.5°). Right now the axial tilt is 23.45°. The axial tilt determines how strong the contrast is between summer and winter. If the axial tilt is large, there is a noticeable difference between summer and winter. We experience this now; summer is hotter than winter. If the axial tilt were greater than 23.45°, summer would be hotter than it is now. If the inclination of the axis were lower, the contrast between the seasons would be lessened. If there were no tilt at all, there would be no difference between summer and winter. In fact, there would be no seasons at all. Mars has a slightly greater axial tilt than the Earth, 25.19°, so the contrast between summer and winter is more extreme for Mars than for Earth.

The 23,000 period is Earth's precessional period, which results from the wobbling motion of the Earth as it spins on its axis (recall the usual analogy of the spinning top). The orientation of the spin axis determines when the seasons occur and, when coupled with the orbital eccentricity, can determine the duration of those seasons. Earth's seasons are of almost equal length—at least they are right now. In comparison the orbit of Mars is more eccentric than Earth and Martian seasons are of unequal lengths.

There are a lot of necessary conditions which must be met for an ice age to occur. The axial tilt must be near its maximum of 24.5°. The eccentricity must be large so that the contrast between summer and winter is large. If the spin axis is oriented properly, winter will be much longer than summer (if the eccentricity is large). An ice age can occur if the nutation, precession, and eccentricity cycles are in sync with each other.

There are some problems with the Milankovich hypothesis. The period with

# Science on Ice

April Whitt  
Fernbank Science Center  
Atlanta, GA

Science on Ice was a paper presented at the June 1998 SEPA Conference in Roanoke. This project was supported in part by the National Science Foundation (NSF) under a cooperative agreement with the Center for Astrophysical Research in Antarctica (CARA), grant number NSF OPP 89 20223. CARA is a National Science Foundation Science and Technology Center.

The National Science Foundation designated April 26 - May 2, 1998 as National Science and Technology Week with the theme of Polar Connections. Fernbank Science Center offered two programs through their distant learning network to introduce students to some Antarctic science.

The Center for Astrophysical Research in Antarctica (CARA) is one of the Centers funded by the National Science Foundation. The author has worked with CARA scientists and educators and visited Antarctica in 1993 to experiment with some educational projects from the South Pole. Drawing on this background, two lessons were developed, one for third grade and one for sixth grade.

Each interactive distance learning session was designed around county curriculum objectives. Among the requirements for third graders are that they describe the difference between the north and south poles of Earth, recall weather phenomena associated with various geographic regions, and recall a characteristic of icebergs.

Sixth graders are supposed to be able to identify which instruments may be used to measure a given phenomenon, recall factors affecting heat absorption, identify the experimental conditions which are controlled, recall a property of water, and identify an effect of the Earth's atmosphere.

Using these objectives as guidelines, activities were located, and materials for teachers were developed. NSF distributed packets containing a poster and booklet of resources. A regional education center sent us 25 packets to distribute to the teachers participating in the distance learning lessons.

The third grade lesson was Science on Ice. One group of students worked at Fernbank Science Center while a second group

was scheduled somewhere else in Georgia. The two groups would interact through the distance learning network's television capability.

Students were divided into teams for the Poles Apart activity. Each team read clues describing the north and the south poles of Earth: temperature, lifeforms, etc. The information was recorded in charts the students used to determine which pole had the coldest temperatures or where polar bears live.



Then each team tested the insulating properties of different materials: cotton balls, a wool scarf, bubble wrap, and feathers. Students predicted which material would best insulate a thermometer. Packing the material around a thermometer in a plastic glass, the whole assembly was placed in a cooler of ice for 20 minutes. Students read the temperature on each thermometer before the material was packed around it and again after 20 minutes in the ice. The difference in temperatures was charted and the best insulator was chosen.

While the insulating materials were on ice, the students viewed slides of the author's visit to The Ice, asking and answering questions about geography, seasons, and living conditions at South Pole.

Finally the students compared tabular and mountainous icebergs, using ice frozen in different shapes. (Many had seen the movie Titanic.) Each chunk of ice was floated in a large clear fishbowl half full of water. Students predicted what each shape of iceberg would do when placed in the water: whether it would float or sink, what proportion of the berg would be above or below the surface of the water, and which shape would melt soonest. Teacher and student reaction to the activities was quite positive.

Sixth grade students participated in Science at the End of the Earth. After a review of latitude and longitude, teams of students used map reading skills to locate points along the route from Atlanta to South Pole. Each team was given a map and a pair of coordinates to find on that map. The resultant points were then arranged in geographical order, and the route was traced on a globe.

For a second activity students compared volumes of snow and volumes of water. Author Janice VanCleave and CARA Education Coordinator Randy Landsberg traveled to South Pole in December of 1997 and shot a video of collecting and melting different types of snow. Students viewed a segment of the videotape and predicted the volume of water that would form from melting snow. They compared volumes of crushed, popped corn (simulated snow), and liquid water. Then they drew conclusions about different kinds of snow.

Finally students used color filters to explore different wavelengths of light as an introduction to infrared (IR) astronomy. Students used red and blue gels to exam

ine ceiling lights, each others clothing and several images from the NST teacher materials. Discussion of the water vapor in the atmosphere and the problems it poses for IR astronomers followed the filter activity. Teacher and student response was again positive.

About a hundred students and teachers participated in these lessons. Teachers completed evaluation forms at the end of each session. Students were invited to contact Fernbank Science Center by electronic mail if they had questions, and teachers were given a list of Websites pertaining to polar science and the National Science Foundation.

Please check out the World Wide Web site <[www.southpole.com](http://www.southpole.com)> for activities, journal entries, and images from the CARA educators trip to South Pole in December 1997.



# Observer for Macintosh



Reviewed by  
Dan Fundo  
Secretary, Memphis Astronomical Society  
Memphis, TN

[My friend Dan Fundo is a long time acquaintance from connections with the Memphis Astronomical Society and with Apple Core of Memphis, the local Apple Macintosh computer users group. I sincerely appreciate his stepping in to review the Observer

software for this issue of Southern Skies.]

A new piece of astronomy software was introduced a while ago for the Power Macintosh computer. This very narrow field of computers has been pretty well dominated by Carina Software's excellent planetarium simulation program Voyager II for several years. Procyon System's Observer, however, isn't a direct challenge to Voyager, a program which is beginning to show its age.

The name Observer is appropriate. The software is more of an observer's aid than a planetarium program. It is also evident that someone with real observing experience wrote the program. There are several features that anyone who regularly uses a telescope, and professes to be an amateur astronomer, should already have and use. Maybe having them incorporated into the program will help.

The one big shortcoming of every piece of astronomical software I've ever seen is the speed and power of the computer on which it is running, regardless of manufacturer. Computers in general are becoming reasonably priced, and if one is to gain full use of the software, the computer should be reasonably close to the telescope.

I know very few amateur astronomers who have their own observatories complete with 120 volt wiring, and only a handful of astronomy clubs nationwide have such facilities. That certainly rules out the use of a desktop computer. Laptop or notebook computers are expensive. According to some recent articles on C net, 10-15% of

all laptops experience some failure in the first year of use. Let's face it, most of the individuals who use laptops are probably using company owned computers, and it wouldn't be career enhancing to break the boss's computer while out in the dark.

The Observer software is available from Procyon Systems. It can be downloaded from the Internet at the address <www.procyonsys.com>. The full Power Mac version is over 2 megabytes. A demo version is available for the older 68000 series processor Macs.

The reviewer used the demonstration version on a Quadra 650 Mac, and a full version on an early 603 Power Computing machine. I also had the opportunity to see a live demonstration by the software's author, David Hearn, at a recent Memphis Astronomical Society meeting. David moved to Memphis from Winter Park, FL, and he now resides in Germantown, TN.

## Interface

Observer follows the Macintosh user interface closely. All of the common File, Edit, and View pull-downs are there. Other items in the toolbar are logical and easy to understand. There is a fairly good, well organized list of help items that cover the entire application available under the Help menu.

On a Power Macintosh, the software loads reasonably fast. Execution of most of the commands is good, but there are long waits on some changes of view. One item that does need improvement is the chart printing capabilities. Chart printing is slow compared to the much older Voyager II program.

## Features

As stated, this is more of an observing aid than a planetarium program. Observer's representation of the stars, both on the screen and on printed charts, is out of scale: the dots are much too large! Understandably, this actually helps out in the field, but if you are accustomed to using any of the printed atlases, there will be a notable difference.

The other item that needs improvement is the tagging or name placement

for objects when that feature is in use. In the more crowded sections of the sky, the Coma Virgo cluster of galaxies for example, the object names overlap. On a small scale they quickly become meaningless and even annoying. If one zooms in for a closer view, the tags do spread out. I have seen most of the astronomical software that is out, and none of the current titles handle this particular feature very well. As far as big negatives go, this is it.

The total star count available is something like 600,000 stars. The Hubble Guide Star Catalog (HGSC) is not included in this current version of Observer, though it may be added later.

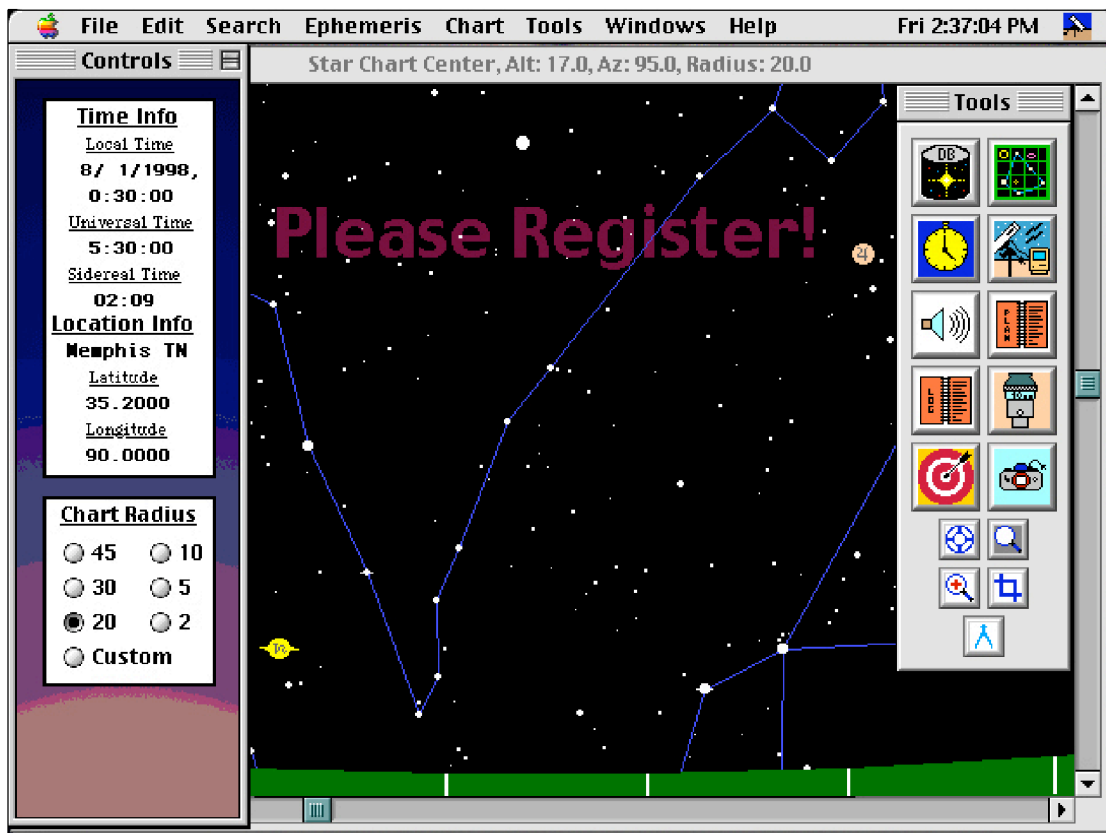
This is actually a plus in my book. The HGSC can quickly overwhelm the observer as well as the computer. It is nice to have available, but for the typical observer and the typical observing conditions we have, it is overkill. Even with Newtonian Dobsonian telescopes of large apertures (aka, light buckets), most folks don't really need to know where every single 15th magnitude star is located.

On the other hand, the program does incorporate almost every known catalog of deep sky objects that is available electronically. Not only the entire NGC, but catalogs of clusters, dim galaxies, clusters

of galaxies and nebulae, a catalog of all the known asteroids with calculated orbits, plus an extensive list of known comets. This could be a comet hunters best single source reference!

All of the included catalogs are available to the public, but in most cases the listings include extraneous data that only a professional will ever need or use. Mr. Hearn's has stripped all but the necessary positioning, classification, and magnitude information from his program. After all, what you need to know is what you are looking at, and the computer has to know what is there, and how bright it is.

If you should be fortunate enough to have a Mac or Mac clone laptop to take to the field, there is a red light option for the display. Everything is presented in a monotone red. The brightness control, however, will have to be turned down also. It should be noted that the tags become difficult to read if the brightness is too low,



Observer's main screen. Controls and Tools may be dismissed when desired.

and some of the symbols used to classify objects begin to lose their distinctiveness. Once again, this is something that no other software handles well either; it is a function of human vision, but one to which an observer can become adapted.

The features mentioned before, that every observer should have, are an eyepiece chart and an observing record. Few casual amateurs take the time to measure the field of view or the magnification of their eyepieces. Observer has a formatted chart on which you can list your eyepieces and the above information. A nice additional feature is that an eyepiece can be selected and that field of view projected onto the chart. In effect, the field of view becomes the cursor. There is also an observing record option to help keep track of what you observe in the course of a night under the stars. It is surprising how few observers take the time to keep records. This makes it as painless as possible. There is sufficient room to add your comments, and the ability to compare the comments from previous sessions.

Along with the eyepiece field of view, there is also a finder F.o.V., including the Telrad® bullseye. This is one of the biggest helps to star hopping that any astronomical program could have. Care should be taken that the field of the displayed chart is wide enough to show the whole field of view or bullseye. It can be very easy to zoom in to a displayed field of less than 4°.

#### Advanced Features

For those who have taken the step to automation, Observer has the program

ming to connect to shaft encoders and to display the exact position to which the telescope is pointing, once the calibration has been made; in effect, it has electronic setting circles. I do not have a telescope with electronic setting circles. At the M.A.S. demonstration, Mr. Hearn's forgot to bring the interface box for the system. The program is capable of handling either an equatorially mounted telescope or a Dobsonian mounted instrument, and any of the common encoder step configurations (i.e., 2000 steps per rotation or 4000 steps per rotation). One outstanding feature is the ability to set the encoders to any incremental step of over or under drive. Most encoder driven systems generally require that the gearing be an even number ratio such as 1:1, 1:2, or 1:4. With Observer, you can enter any ratio that you choose.

Another good feature is the ability to reset the calibration without having to go back through a long procedure. All you have to do is center the star or object in the field of the telescope; then drag the pointer on the display to that object and tell the computer to correct. This makes identifying unknown objects about as easy as can be. It also means that misalignment on an equatorial mounting won't keep you off the mark for long. The program is not capable of full hands off automation at this time.

Observer has several features common to other programs: zooming, printing charts, including field of view of a selected eyepiece or finder, setting the horizons, etc. Overall Observer is a very good application.

If you are fortunate enough to have a PowerBook computer, and if you are willing to take it into the field, then Observer is a must have accessory for your observing experience.



# *Southern Skies*

VOLUME 18, NUMBER 3

JOURNAL OF THE SOUTHEASTERN PLANETARIUM ASSOCIATION

SUMMER 1998

## In This Issue

President's Message.....	1
1998 Paul Campbell Award Recipient.....	1
IPS Report.....	2
Science NetLinks from MCI and AAAS.....	2
Editor's Message: The State of the Association.....	3
SEPA Membership Form.....	3
Featured Planetarium: Hopkins Planetarium, Roanoke, Virginia.....	4
Small Talk.....	6
Book Review: A Man on the Moon: The Voyages of the Apollo Astronauts.....	8
Book Review: Rocks from Space.....	9
Her Own Space: SEPA Souvenirs and Imagery.....	10
News from SEPA States.....	12
1998 Door Prize Contributors.....	18
HST's Greatest Hits of '96.....	20
HST's Greatest Hits of '97.....	21
JPL '98 Slides.....	22
AstroVideo Review: Cathedrals of the Sky.....	23
The Orbital Mechanics of Ice Ages.....	24
Science on Ice.....	26
Digital Cosmos: Observer.....	28

SEPA's Web site url is  
<<http://kpt1.tricon.net/Org/baysmtn/sepapage/sepa.html>>

Southern Skies is the quarterly journal of the Southeastern Planetarium Association published for the purpose of communicating association news, reports, reviews, and resources to its members. Contents © 1998 by the Southeastern Planetarium Association and individual authors. Permission is granted to reprint articles in other planetarium, astronomy, or science related publications under the following conditions: 1. Attach a credit to the article stating, "This article was originally published in Southern Skies, journal of the Southeastern Planetarium Association;" and 2. Send courtesy copies of your publication to the Southern Skies editor and the author.

### Officers

President  
Mike Chesman  
Bays Mountain Park Planetarium  
853 Bays Mountain Park Drive  
Kingsport, TN 37660  
Voice: (423) 229-9447  
Fax: (423) 224-2589  
Email: baysmtn@tricon.net

President-Elect  
George Fleenor  
Bishop Planetarium  
20110th Street West  
Bradenton, FL 34205  
Voice: (941) 746-4132  
Fax: (941) 746-2556  
Email: Jetson1959@aol.com

Secretary/Treasurer  
Duncan R. Teague  
Craigmont Planetarium  
3333 Covington Pike  
Memphis, TN 38128-3902  
Voice: (901) 385-4319  
Fax: (901) 385-4340  
Email: StarMarTNG@aol.com

Past-President  
Kristine K. McCall  
Sudekum Planetarium  
800 Fort Negley Boulevard  
Nashville, TN 37203  
Voice: (615) 401-5077  
Fax: (615) 862-5178  
Email: mccalk@ten-nash.tenk12.tn.us

IPS Council Representative  
John Hare  
3602 23rd Avenue West  
Bradenton, FL 34205  
Voice: (941) 746-3522  
Fax: (941) 747-2556  
Email: jlhare@aol.com

Southern Skies Editor  
Duncan R. Teague  
3308 Bluemont Drive  
Memphis, TN 38134-8454  
Voice/Fax: (901) 388-3266  
Email: StarMarTNG@aol.com

### Associate Editors

AstroVideo Review  
Mike Chesman  
Bays Mountain Park Planetarium  
853 Bays Mountain Park Drive  
Kingsport, TN 37660  
Phone: (423) 229-9447  
Fax: (423) 224-2589  
Email: baysmtn@tricon.net

Digital Cosmos  
Erich Landstrom  
Aldrin Planetarium  
4801 Dreher Trail North  
West Palm Beach, FL 33405  
Voice: (561) 832-1988  
Fax: (561) 833-0551  
Email: starlite@gate.net

Featured Planetarium  
Dave Hostetter  
Lafayette Natural History Museum  
and Planetarium  
637 Girard Park Drive  
Lafayette, LA 70503  
Phone: (318) 268-5544

Laser Talk  
Mark Howard  
Buehler Planetarium  
3501 SW Davie Road  
Davie, FL 33314  
Phone: (305) 475-6681  
Fax: (305) 474-7118

Reviews  
Patrick McQuillan  
Alexander Brest Planetarium  
1025 Museum Circle  
Jacksonville, FL 32207  
Phone: (904) 396-7062  
Fax (904) 396-5799  
Email: PatAstro@aol.com

Small Talk  
Elizabeth Wasiluk  
Berkeley County Planetarium  
Rt. 1, Box 89  
Hedgesville, WV 25427  
Phone: (304) 754-3354  
Fax: (304) 754-7445



# SEPA 1998 Conference Sponsors

Kimberly Ayers  
GOTO Optical Mfg. Co.  
12 Champagne Dr.  
Nashua, NH 03062

Patrick Murphy  
Pangolin Laser Software  
771 South Kirkman Rd., Suite 113  
Orlando, FL 32711

Stephanie Hopper  
Astro Tech Manufacturing, Inc  
231 Locust St.  
Canal Fulton, OH 44614

Kosuke Sasaki  
Minolta Planetarium  
100 Williams Dr.  
Ramsey, NJ 07466

Stephanie Hare  
Laser Fantasy International  
1721 132nd Ave. N.E.  
Bellevue, WA 98005 2224

Pearl Reilly  
Seiler Instruments & Manufacturing Co.  
170 E. Kirkham Ave.  
St. Louis, MO 63119

Charlie Holmes  
Spitz, Inc.  
PO Box 198 Route 1  
Chadds Ford, PA 19317

Joe Hopkins  
Joe Hopkins Engineering  
4301 32nd Street West, C1  
Bradenton, FL 34205

Joanne McCullough  
Audio Visual Imagineering  
10801 Cosmonaut Boulevard  
Orlando, FL 32824

Steven T. Savage  
Sky Skan, Inc.  
Nashua, NH 03060 4513

Jeff Bowen  
Bowen Productions  
748 East Bates Street  
Suite 300W  
Indianapolis, IN 46202

Jon Frantz  
East Coast Control Systems  
PO Box 486  
Bigler, PA 16825 0486

Eric Melenbrink  
Ash Enterprises  
1221 Stanhope Ave.  
Richmond, VA 23227

Steve Heminover  
Aura Technologies  
775 West Jackson Blvd., 4th Floor  
Chicago, IL 60661

Larry Polla  
Mega Systems  
110 Riberia St.  
St. Augustine, FL 31084