Southern Skies

Volume 23, Number 1 Journal of the Southeastern Planetarium Association Winter 2003

In This Issue

The deadline for the next issue of *Southern Skies* is April 1. Send your submission either on a 3.5" disk or *via* email attached file to <dteague2@midsouth.rr.com> or <teagued1@k12tn.net>.

Officers

Associate Editors

President's Message

As I begin my presidency in 2003, the first thing I'd like to do is thank Dave Maness for doing such a fine job as president of SEPA over the last two years. I would also like to recognize George Fleenor for giving six years of invaluable service to this organization. In addition, I want to welcome Duke Johnson as President-Elect to the SEPA council.

As of January 1 Dave Maness becomes our Past-President, while Duncan Teague continues to serve as Secretary-Treasurer, and John Hare continues to serve as IPS Council Representative. I look forward to working with these individuals over the next several years to continue making SEPA the wonderful organization it is.

For those of you who do not know me that well, I have worked at the Kenner Science Center Planetarium and Observatory since its opening in 1989. It is the only planetarium at which I have ever worked, and my years of involvement with SEPA have helped make my job a rewarding and fulfilling experience. Over the years, I have made several friends in this organization, and their expertise and advice has made me a better Planetarian. I hope SEPA will always have this spirit of friendship and cooperation.

The year 2002 was interesting for me in both a bad and a good way. On the bad side many of you already know that I broke my left hip and knee, and I'm still undergoing physical therapy. I want to thank all who contacted me and wished me well after the accident. On the good side, my wife, Connie, and I had our first child on September 7. Her name is Arianna Celeste, and she and mother are both doing well.

I would like to let everyone know that if you have a question, suggestion, or any type of constructive criticism, please feel free to contact me or any other SEPA Council member, and I promise we will work to address your concerns. By the way, if you have never noticed, all of our contact information is on the inside front cover of *Southern Skies.*

This year's SEPA conference in Baton Rouge, Louisiana is expected to be a wonderful meeting. There will be many highlights and innovations shown at this event. As most of you know we had a small problem last year, and to address this, we are going to have a conference site committee headed by George Fleenor. I expect to name two other people to assist George in the near future. Their job will be to seek out sites for future conferences and possibly set minimum criteria for future conference sites. Also, along these lines, if anyone has held a conference in the past, I would appreciate any suggestions or input you may have for future conferences. I know Chris McCall has already provided me with some of this information, and I think this would be helpful for people who will host future conferences.

I'd like to address the wonderful job Duncan Teague does as editor of our journal, *Southern Skies.* Unfortunately I know this is a difficult position because sometimes he does not have a lot of material to work with. I know that in our field, we are all very busy, but I would hope that we could find more time to make *Southern Skies* the professional journal it deserves to be. I have a few suggestions for possible submissions to the journal. This would include astronomical handouts that you would not mind sharing with other facilities. I would also love to see historical accounts of facilities or possible economic solutions that you have found useful at your planetarium. If you think you can be of service with any of these suggestions or with any other submissions, please contact Duncan, and he would be more than pleased to hear from you.

Michael Sandras
President
Kenner Science Center
Planetarium
Kenner, Louisiana

Everyone in SEPA should also be aware of the Paul Campbell Fellowship Award. Nominations are currently being accepted for the 2003 recipient of this award. Remember to qualify for this award, nominees must have been a member of SEPA for at least ten years, and they must display qualities in each of five areas, as represented by the five-pointed, star shaped award: integrity, friendship, service, knowledge, and vision. If you would like to nominate someone for this award, please contact any of the SEPA Council members.

I know from talking and communicating with many of you that at times you feel your job is somewhat overwhelming, but I wanted to pass this bit of information on to you. I had the chance to meet with noted astronomy author and comet hunter David Levy at the 2002 Deep South Regional Stargaze held in McComb, Mississippi. He was the main speaker at this event and had the chance to talk with over 150 amateur astronomers. He mentioned that the most overwhelming concern of these participants was the astronomical education of young people. Personally I agree with this whole-heartedly, and I know that there are many times you think in your job as a Planetarian, your audiences may not care. Just remember all of those people—and especially the children—whose interest you may have sparked, and the journey you have started.

IPS Report

John Hare
Ash Enterprises
Bradenton, Florida

IPS had a new set of officers effective January 1st of this year. Martin Ratcliff moved from President to Past-President. Jon Elvert moved into the position of President, and the newly elected President-Elect, Martin George of Australia, joined the other four American officers, who also include Shawn Laatsch, re-elected as Treasurer, and Lee Ann Hennig, re-elected as Secretary.

In his final report to Council, Ratcliffe announced that the IPS conference in Wichita generated net proceeds of at least $55,000. As a result of these proceeds, the committee headed by John Dickenson has been given the go ahead for proceeding with strategic planning that includes some potentially dramatic changes for the structure of the organization. I'm sure Dickenson will have some comprehensive recommendations for this year's Council meeting.

IPS bids "farewell" to outgoing Past-President, Dale Smith. Smith's term as President was unprecedented as his travels in that capacity took him around the world on many occasions. As a result of his efforts, tremendous international growth was undertaken for the benefit of the planetarium community as a whole. Smith will continue to serve IPS on the committee level.

The 2006 conference site, as previously reported, was to have been selected between bids from Vienna, Austria and Melbourne, Australia. Shortly before the end of last year, Vienna expressed regrets in having to withdraw their invitation. As a result, Council representatives were asked to cast their votes early instead of at the Council meeting in October since there was no competition, and the additional time would be beneficial to the next host. Since this was a no-brainer, I went ahead and cast the SEPA vote as "affirmative" for Melbourne.

Upcoming IPS conferences are in Valencia, Spain 2004, and Melbourne as mentioned above. In order to attend you need to be an IPS member. What better time than now to consider joining? Look at the many benefits you will receive.

- 4 issues a year of the journal *Planetarian*
- the *IPS Directory of the World's Planetariums*
- the *IPS Resource Directory*
- occasional special publications
- low subscription rates to the new IPS slide service
- low prices on IPS video disks
- access to Astronomy Link
- notices of the biennial IPS conference
- access to all resources on the IPS Web site, including soon to be created members-only pages
- best of all, being part of a global community of dedicated planetarians like yourself

Contact me at <jlhare@aol.com> (941-746-3522) to receive a membership application, or contact IPS at <http://www.ips-planetarium.org>.

Suite veranda view of Christmas Day approach to Ushuaia, Argentina, Earth's southernmost city (see Editor's Message: Upside Down Astronomy on the opposite page)

Editor's Message: Upside Down Astronomy

Duncan Teague
Secretary-Treasurer
Craigmont Planetarium
Memphis, Tennessee

Judy and I had the good fortune and delightful experience of spending the Christmas holidays with our younger daughter Christine. While that might not sound like an extraordinary event in most people's lives, you should know that our little Christine is the Social Hostess/Assistant Cruise Director aboard the Silver Shadow, a ship with Silversea Cruises, Ltd.

We flew to Santiago, Chile; enjoyed Chilean fjord panoramas; visited Ushuaia, Argentina, the southernmost city in the world, on Christmas Day; sailed around Cape Horn; saw penguins near Punta, Arenas, Chile; ate barbeque in Montevideo, Uruguay; and visited the Eva Peron Museum in Buenos Aires, Argentina. I also set a new personal best for being lazy: I slept for 11 hours one night. I did manage to read three books over the span of a couple of weeks, a luxury of spare time I don't often have.

I had greatly anticipated getting to see the sky of the southern hemisphere for the first time. For the first week of the 16 day cruise, however, all we saw when we looked skyward at night were clouds and occasional rain. It would be beautiful during the day as we gazed at snow-capped mountains, glaciers, and waterfalls, but at night I saw a grand total of six stars over the first ten days of our trip.

Finally, on New Year's Eve, after we left our seven course dinner in the restaurant, danced to Auld Lang Syne, and welcomed Father Time and Baby New Year, I saw a clear sky to the southeast for the first time. There were a couple of very bright stars. I thought they looked like Alpha and Beta Centauri, but the brighter of the two was on the wrong side. Another nearby star pattern looked a bit like Libra, but I didn't know what it might be. I vowed when I got home to check the *Voyager* software on my computer for that viewing time and location to learn what stars I had seen.

Boy, did I feel silly when I realized that what I saw was indeed Alpha and Beta Centauri and the Southern Cross. I had assumed, mistakenly, that I wouldn't see them until near sunrise. But, I was so far south—latitude 56° S—that these southern hemisphere stars were circumpolar. They were above the horizon in my mind—much higher than the real horizon on the Atlantic Ocean.

It's one thing to teach astronomy, It's quite another thing to *experience* astronomy, especially from some unfamiliar location. In this instance, I was on a roller coaster of the mind. Being disoriented can be fun, and experiencing some upside down astronomy with your soul mate can be truly exhilirating.

SEPA Membership Form

Please send your check for $25 (or $15 if outside the SEPA geographical region) to
SEPA, c/o Craigmont Planetarium, 3333 Covington Pike, Memphis, TN 38128-3902

Name _____

Organization _____

Planetarium _____

Address _____

City _____

State _____

Zip Code _____

Voice Phone _____

Fax Phone _____

E-mail Address _____

Staff Position _____

IPS Member? Yes _____ No _____

Small Talk

Elizabeth Wasiluk
Hedgesville High School
Planetarium
Hedgesville, West Virginia

I wanted to let you know that the CD I mentioned in my last column came in the mail this week, and it looks great. It is an enhanced CD, which means if you play it on a standard audio CD player the first track is blank, because it contains pictures you can see if you place it in the CD drive of your computer. Then you can see how Jack placed all those musicians in his not-so-large dome.

The concert was recorded live March 8th and 9th, 2002 in the Ralph Mueller Planetarium in Lincoln, Nebraska. It contains classical musical pieces written by astronomers: Sir William Herschel, Martin Gaskell, and Valentine Doroshenko. Jack made the offer at the IPS meeting in Wichita, Kansas in July, to burn CDs for anyone interested. Just send him a blank one. You might like to also toss in a couple of bucks for postage.

Jack Dunn
Ralph Mueller Planitarium
University of Nebraska State Museum
210 Morris Hall
Lincoln, NE 68588-0375

I did my annual science camp at a new school, Eagle Intermediate. It rained both days, and I ended up using the neat scale model drawings of rockets and the space shuttle that Dave Hostetter from the planetarium in Lafayette, Louisiana made and brought to a past SEPA meeting.

One of the interesting things I discovered was that most fifth graders attending my science class could only name one astronaut: Neil Armstrong. Most could not name what he did to made him well known. I guess I felt I was taking up the challenge that Andrew Chaiken offered when he talked at the National Air and Space Museum about the need to pass the legacy of space flight on to our children.

I showed the relative sizes of the different rockets and their use in the American space program. I also passed out *[Maybe you were working too hard, Betty. —Ed.]* and made use of some HST trading cards with pictures of both planets and extra-galactic sources. I got mine from John Stoke last summer. You can too if you send an e-mail and request some.

A home school group visited my planetarium to view a seasons program. They wrote to my principal and instructional assistant superintendent saying that they didn't like my program. I was puzzled by this. I thought they left as happy campers. I was unaware that they didn't like the term "solstice" because it has "pagan connotations." At least that was the sense I could make from the notes they wrote.

I'm not used to getting bad reviews, I must admit it kind of knocked me for a loop. I had to dissect what I said to figure out why they were so offended.

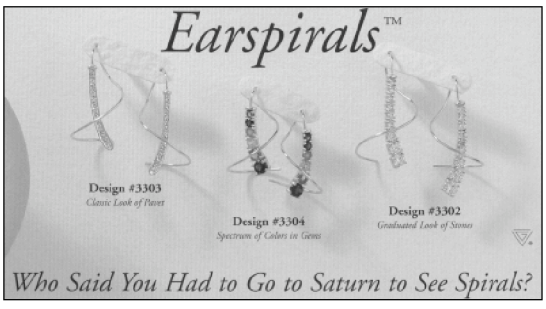
I was concerned with what I said in the planetarium and how it might be misconstrued by visitors. I can change the term "solstice" if people find it so offensive and instead refer to the "highest and lowest points the Sun reaches in the sky during the summer and winter." But honestly, isn't that getting a bit ridiculous?

By the way, I came across two good Websites while researching for programs I plan to do in the future. One can be used for Christmas or seasonal programs: <http://candlegrove.com/solstice.html>.

It has multi-cultural references to seasonal celebrations. Another is a NASA Website that lists menus for astronauts on space missons from early Mercury space probes to ISS. Find it at <http://spacelink.msfc.nasa.gov/products/Space.Food.and.Nutrition/index.html>. You can get it as hard copy from NASA CORE, if you don't wish to download the file. Go to <http://core.nasa.gov/>.

Students reported getting out to see Leonids with their families. I posted a message on a common board that wasn't astronomical. Students said they saw great diplays if it wasn't cloudy. Some commmented it wasn't as great as last year, and that could be because of the Moon plus not having the luxury of a holiday break to stay up late or get up as early as last year. All in all, most comments I read were favorable.

You've likely heard of Phil Plait's *Bad Astronomy* Website and book. I came across an sample of it in the following ad that came in my holiday mail. I am sending a copy of it for Duncan to scan. Has anyone ever seen "spirals" on Saturn? I haven't either.



Here's a recommended holiday book: *Saturnalia* by Phil Fleishman. It's recommended for ages 12 and up. It's dark, kind of like the season, but it has some great, accurate astronomy in it. It only has 112 pages, so you can probably read it in one sitting.

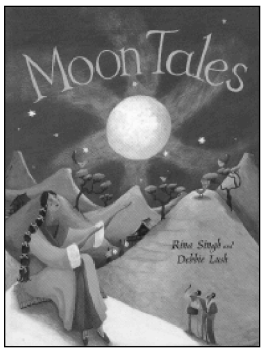
Now that 2003 is here, I wish you all a great year under the dome.

Book Review

Moon Tales: Myths of the Moon from Around the World

Donna Thomas
Craigmont Planetarium
Memphis, Tennessee

Moon Tales, Myths of the Moon from around the World
Written by: Rina Singh
Illustrations by: Debbie Lush
Trafalgar Square Publishing
North Pomfret, Vermont
Hardcover: $22.95
ISBN 0747541124
Paperback: $13.95
ISBN 0747547955



Moon Tales is a delightful collection of mythological stories in which the Moon is a main character. Each story is written from the perspective of a different culture and features characters representative of that culture. There are ten cultures represented in the book: Chinese, Jewish, West African, Polynesian, Siberian, Canadian, Indian, English, Japanese, and Australian. Each of these myths has either a moral or attempts to explain scientific phenomenon or both. *Moon Tales* is also wonderfully illustrated, reflecting the culture about which the story is written.

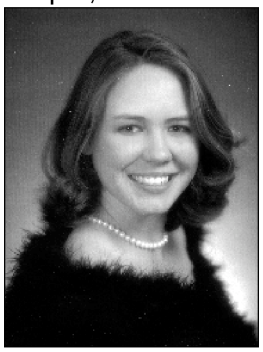
The "Greedy Man", a Chinese myth, attempts to explain the "Man in the Moon" and also has a moral. As the story goes, a kind and generous man nurses an injured bird back to health. Afterwards, the bird rewards the man with riches. The Generous Man tells his neighbor, the Greedy Man, about the bird and his reward. In an attempt to receive similar rewards, the Greedy Man intentionally injures a bird, nurses it, and then expects to be rewarded. Instead of receiving a reward, the man is given a pumpkin seed, which grows a vine to the Moon. The man climbs the vine to the Moon expecting to find his reward there. When the vine disappears, instead of receiving a reward, the man is trapped on the Moon. The Greedy Man is then left to live out his life on the Moon.

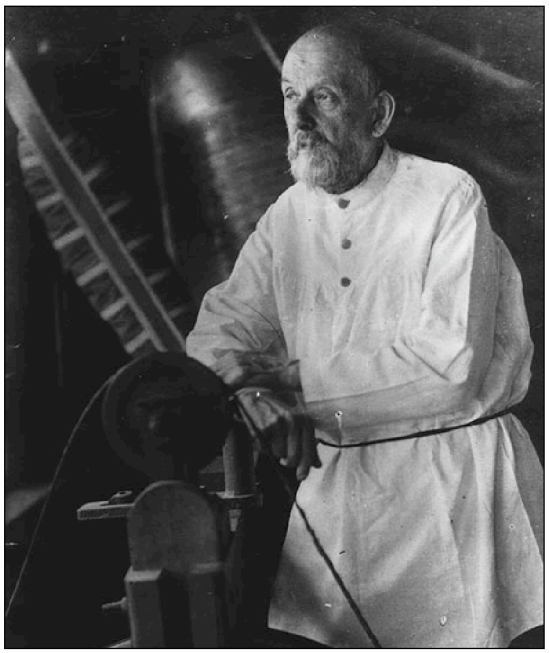
In the Indian story, "The Sun, Wind, and the Moon", each of these natural phenomena is personified as a child of Star Mother. Throughout the story, Sun and Wind are harsh bullies to their brother, Moon. All three children are invited to the wedding of Thunder and Lightning. Upon their return from the wedding, Sun and Wind bring left over food home, but when asked, do not share with Mother Star. Moon, however, shares his food with her. Sun and Wind are punished by Star Mother for being so self-centered and greedy. From that time forward, Sun and Wind bring harsh weather on the people of India and are therefore reviled by the people. Moon, however, is made to bring soft light on the people in the coolness of evening and therefore rewards the people. He is forever loved by the people of India.

Each story tells a similar tale of good *versus* evil. The stories are entertaining and at the same time teach a lesson. This book would be a great addition to a classroom. The stories could be read by students or read out loud by the teacher. The book is recommend for readers of age 8 – 11.

Rockin' the Cradle

Amanda Campbell
Senior Intern
Craigmont Planetarium
Memphis, Tennessee





"The Earth is the cradle of the mind, but we cannot live forever in a cradle." The visionary Russian rocket scientist Konstantin Tsiolkovsky made this statement a century ago. His far-fetched ideas have landed him a place in the history books forever.

Tsiolkovsky is universally considered the father of astronautics. While the Wright brothers focused on flying an airplane for the first time, he was writing his *Investigation of World Spaces with Reactive Devices, 1903.* He introduced the idea of rocketry to thousands of bright, young engineers and designers, while never working on a rocket himself.

Tsiolkovsky's first ideas were inspired by writer Jules Verne. His skill in mathematics and science lead to calculations for stabilizing a spacecraft and how to reach escape velocity from Earth's gravity. He proposed using liquid instead of solid propellants.

Despite his hearing loss at age ten and without any formal education, he published over 500 scientific papers. Although Tsiolkovsky didn't live to see the first rocket launch, his theories and calculations allowed Yuri Gagarin to be the first man to travel into space. His contributions had a profound impact on the world. Without Tsiolkovsky the idea of space travel may not have come to maturity.

Digital Cosmos: *Voyager 3.21* for Macintosh

Paul Trembley
Orlando Science Center
Planetarium
Orlando, Florida

The *Voyager* software has been around since 1989, and for the most part it has been the top selling desktop planetarium simulator/astronomy program for the Mac from day one. It's published by Carina Software. You can find them on the Web at <www.CarinaSoft.com>. Voyager III is now available for all Macintosh PowerPCs running System 8, 9, or OS X, as well as Pentium 200s running Windows 98, ME, 2000, or XP. Needing only 8 MB of RAM, 20 MB of drive space, a 4X CD ROM, and a color display, there should be no reason this software would not run on any machine built in the last 5 years, with perhaps one exception: the Windows demo version I tested does not like Windows 95.

When it's first run, the software has a default location of San Francisco. A quick glance of the cities list shows Orlando as well as just about every other major city in North America. A quick click of the mouse, and location and time are set. This setting, as well as just about all other settings, can be saved and recalled with ease from the File menu, so keeping multiple locations at hand is a snap.

Just about every single feature of this software is intuitive. If you want to look at the sky at a certain time, type in the desired time, and off you go. If you want to look at constellation figures, click on Display and then on Constellations. Choose either stick or figure and the figures appear in all their glory. Of course you don't have to display all 88. You can pick which constellations you want to view, and turn off the rest. This is nice in that it keeps the sky from being cluttered.

Simulations are fantastic! It takes a bit a work to get set up, but no more then I would expect, and the results are fantastic. There was a demo of the 2017 solar eclipse as seen from South Carolina, which illustrates a unique aspect of the software—the ability to have two views of the event running at the same time. In one window has a 180° view of the sky centered on the Sun; the other window, a close up view of the Sun. With time step active, I could see which planets would be visible as well as see details of first/last contact. The fact that all of this can be saved for later review, is the mark of good software.

Astronomy software is only as good as whatever database it uses, and one of the best was used as the basis for *Voyager III*—the Hipparcos catalog. In addition, the Tyco and the Hubble Guide Star Catalogs are also available. Using these, deep star fields can be recreated with amazing accuracy. Because of the parallax data that's found in the Hipparcos catalog, *Voyager III* allows interstellar travel. What does the sky look like from near the Pleiades cluster? *Voyager III* can show you.

Time is not an issue either, with a range of dates from 8,000 BC – 12,000 AD, there isn't much you can't find to look at. You can very easily control brightness, magnitude, star color, spectral type, labels, grids, objects, *etc.* If it can be displayed, you can control it.

Importing new orbital elements is incredibly easy as well. You have a choice to enter the orbital elements by hand, or you can import a text file of them that has been downloaded from any number of Internet sites. So long as the text files have been set up in the standard format, any source will work.

All controls are provided either from drop down menus or floating tabbed panels, in addition to an icon tool box, which also floats. So finding a control is not hard, and often it can be found in more then one place.

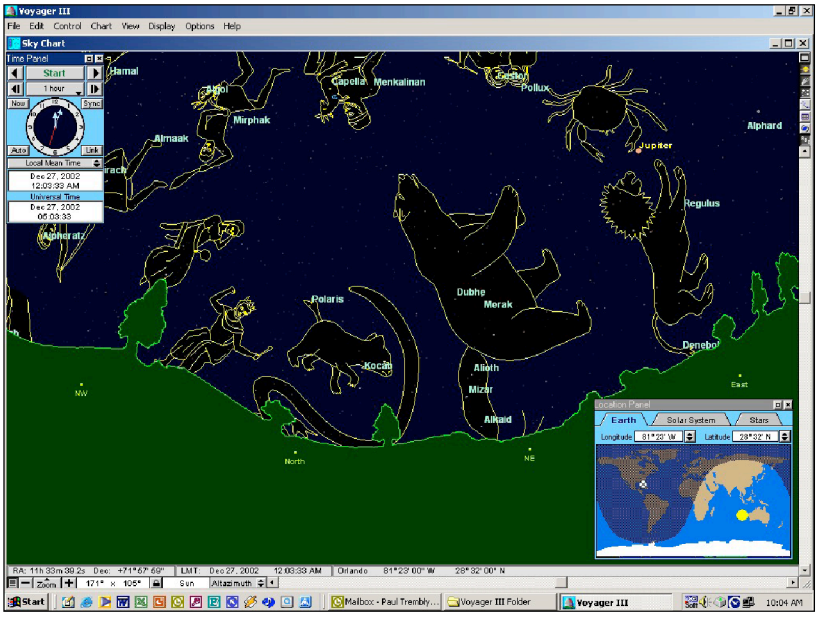
Regular readers of the Digital Cosmos column know that printed charts are one of my stringent standards for astronomy software, and this package passes with flying colors. Whether you print in black and white or in color, the charts are clear, concise, and easy to read. They are perfect for a night's observing or for distributing at a star party.

There are over 1,000 images from David Malin and Tony Hallas, a Hubble image archive, and turn of the century photos from Lick Observatory. As an add on, telescope control can be accomplished with the program *SkyPilot,* also available from Carina.

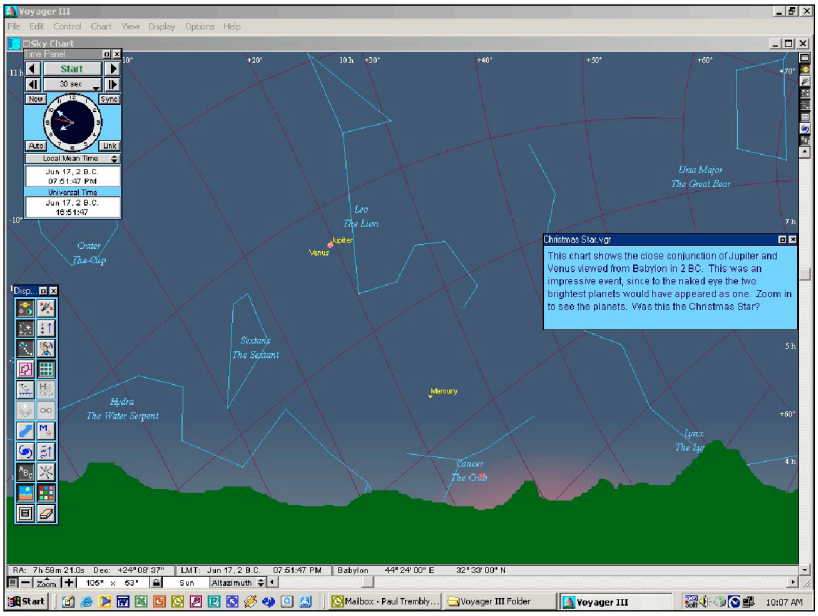
This program is an educator's dream. Students will have no trouble using the software; hobbyists and serious amateurs will find it equally as useful. As for planetarium use, *Voyager III* ranks up there with the best.

What would you expect to pay for all this? The list price is $160.00, but I have seen the so-called junior version, *SkyGazer,* that is packaged with low priced telescopes and available by itself for $80. *StarGazer* lacks some of the technical features like orbital elements of comets and satellites. It's intended mainly for the education market in that it's very non-mathematical and focuses mainly on astronomical concepts.

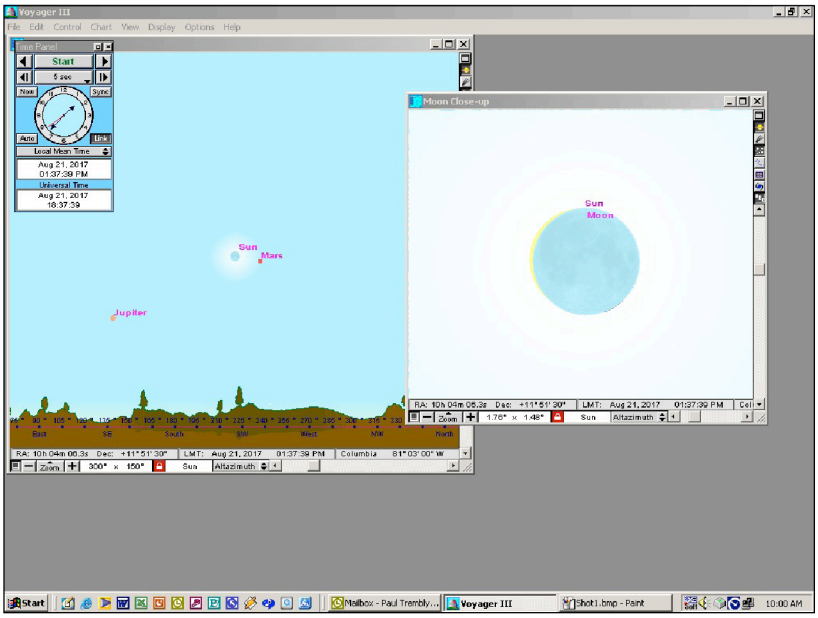
This is a good software package, and it deserves to hold the title of leading astronomical software for the Mac. Now that a Windows version is available, you will no doubt see it rise to the top as well.



Voyager allows you to display either a default horizon or to create your own. Constellations can be either stick figures or allegorical figures.



Voyager simulates one of the theories about the Christmas Star, a close conjunction of Jupiter and Venus in Leo.



Voyager simulates the total solar eclipse of 2017 as seen from South Carolina in one window, while it shows a close-up of the Sun and Moon in another window.

News from SEPA States

George Fleenor
Geographics Imaging
Bradenton, Florida

Buehler Planetarium & Science Center, Davie

Susan J. Barnett reports: The Buehler Planetarium & Observatory is running public shows four days a week. The weekend shows and monthly specials include *In Search of New Worlds, In My Backyard, The Explorers of Mauna Kea, Galaxies,* and *The Light-Hearted Astronomer.*

We continue to rotate shows on Wednesdays, and these shows include *The People, Ancient Horizons, The Explorers, The Voyager Encounters, The Secret of the Cardboard Rocket,* and *The Mars Show.*

Orlando Science Center, Orlando

Paul Trembly reports: During the holidays we ran *'Tis the Season,* and after the winter break will be running *StarQuest,* a show we wrote back in 1998. Our new CEO is starting to get settled in, and small improvements in all areas of the center are beginning to appear. We have been kept busy with our annual Film Festival of large format films; 17 films in 8 weeks is a lot of platter swapping. We will be opening our next planetarium show *Just Imagine* the middle of March.

Otherwise things are rather quiet. As 2003 progresses, we will be having several Saturn parties leading up to the arrival of Cassinni, and we are working with the local university to bring astronomy classes to both the observatory and the planetarium.

Science Center of Pinellas County, St. Petersburg

Wayne Tripp reports: Hello fellow SEPA members. This is my first report to the *Southern Skies* journal and hopefully the beginning of a beautiful relationship.

We have been very busy at the Science Center. We recently replaced our 1970s era Apollo Eros planetarium projector with the New Minolta Media Globe. George Fleenor was instrumental in persuading our Director, Susan Gordon, and Board President, David Knowlton, into checking out this awesome system. After meeting with Philip Groce, the local Minolta representative and experiencing this amazing new product, they bought one.

All I can say is that this is not just a planetarium projector; it's more like a virtual reality machine. The next step is to upgrade the planetarium room, change and relocate the seats, raise the floor for better viewing, and add a control consol with a light blocking entrance/exit area.

Beginning last December 7th, the Science Center is now open Saturdays from 10 a.m. – 4 p.m. A $5.00 admission covers all activities that day.

Well, that's all for now. I hope everyone had a great holiday, and may your skies be clean and clear.

Alexander Brest Planetarium, Jacksonville

The staff of the Alexander Brest Planetarium wants to wish everyone in the SEPA community a happy and healthy new year. Things are quite busy for us at this time of the year. Our white light laser was out for regassing in late fall, but it has now been reinstalled.

We are running *Beatles Greatest Hits* as a matinee show on weekends and will be running our weekend evening programs starting the end of February. This time around we will be running *Led Zeppelin: Greatest Hits* and *Pink Floyd: Dark Side of the Moon* (surprise, surprise). These have been our two best attended shows ever.

As for public planetarium programs we are running an in-house production titled *A Trip Thru Space. What's Up? What's Up?* is the standard live night sky tour. *A Trip Thru Space* is a multimedia program that takes visitors on a tour of the night sky from Earth then a whizbang trip through the solar system and the galaxy.

We also run this star show as a school program for the third and fourth grade. It has been very well received by both the school groups and the general public. We offer this program for sale. So if you are looking for a good all around fun show, give us a call.

In late February we will host our 11th annual StarDate Weekend. This is our special event that give homage to the science fiction world. Events are hosted by the local Star Trek fan clubs. This has been a wildly successful event.

Activities include science fiction games like Who Want to be A Jedi? and Wheel of Trek; a large vendor area with collectibles; door prizes; Space Rock Laser show; a planetarium program that discusses some of the actual places mentioned in Science Fiction TV and movies and what they are really like (*e.g.,* could life exist on a planet around Rigel? And would they be green skinned human looking women like in the Star Trek episode The Cage?); name that SciFi tune; and more.

Guests include Don Perlin, a comic book artist who has worked for many comic labels including Marvel. He has drawn for Spider Man, Werewolf at Night, Fantastic Four, created Moon Knight, and many more. Arne Starr will also make an appearance with some information on upcoming movies (with clips).

After that it is planning for National Astronomy Day in May. Then, of course, the summer of Mars. Geez, I think I'm behind on the press releases for that already.

Fernbank Science Center, Atlanta

David Dundee reports news from Fernbank: 2002 closed with an 18% increase in public attendance. This spring for children we are running *Dinosaur Skies* from March 29 – May 25 and our regular show is *Planets of Fire* from March 5 – May 25. Opening for children on June 7 is *Flying Suacer Mystery,* and opening on May 28 is our summer show *Spaceflight,* in honor of the centennial of flight. Speaking of the centennial of flight, we have been hosting lectures and movies on Friday evenings in the planetarium through 2003 all with aviation themes. Ed Albin and Angela Sarrazine just came back from a successful run on Kitt Peak using the 36" and this summer Angela has time on the 400" on Mauna Kea.

Georgia Southern Planetarium, Statesboro

You can find the Georgia Southern University Planetarium on the Web at <http://www2.gasou.edu/physics/planetariumpage1.html>.

A star show of current night sky and telescopic observing (if skies are clear) follows our planetarium presentations. The Statesboro Astronomy Club will also meet following planetarium presentations. New members are welcome.

Following are our 2003 Planetarium Public Evenings and Special Events:

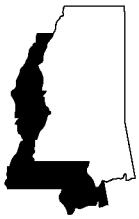
- January 10, 2003, 7:30 p.m., *Searching For ET* by Mike Downing: Is there life out there in the universe, and how are we looking for it?
- February 7, 2003, 7:30 p.m., Legends Of The Night Sky by Marla Johnson: Hear the fascinating stories and mythology of the beautiful constellations.
- March 7, 2003, 7:30 p.m., *Meteorites And Asteroids* by Dr. Michael Kelley: What is the connection between meteorites and asteroids? Dr. Michael Kelley of the Georgia Southern Department of Geology and Geography will explore this topic. Meteorites will be on display for viewing.
- April 5, 2003, 10 a.m. – 4 p.m., Astronomy And Space Day 2003! Join members of the Statesboro Astronomy Club and the Georgia Southern University Department of Physics for a fun day filled with astronomy and space science activities, star shows, rockets, and NASA-JPL videos of space exploration. Moon rocks and more on display! Hope you can join us!
- April 5, 2003, 7:30 p.m., Star Party At The Garden (At the Georgia Southern Botanical Garden): Join us for a night of planet and star gazing outdoors, if clear, at the Georgia Southern Botanical Garden. For more information, please call the garden at (912) 871-1149. This is a free public event, so plan on bringing the whole family on out for a night of star gazing at the garden. Bring your binoculars and/or telescope, blanket or chairs, and a red filtered flashlight if you have one. The Botanical Garden is located on Bland Avenue. From Fair Road (Highway 67) turn onto West Gentilly. Take the first left, and bear left onto Bland Avenue. Turn left through the main garden gates and park. There will be someone there to guide you to the observing area. Hope to see you there! For more information, please call the Georgia Southern Botanical Garden at (912) 871-1149. Web site: <http://www2.gasou.edu/garden/>.

[It's not clear from the form in which this list was submitted how the following are different from the previous list, but here is another set of special events. —Ed.]

- January 10, 2003, Note Special Time: 6 p.m. Amy Lovell, ASC: Kid's Open House, Bradley Observatory
- February 14, 2003, Amy Lovell, ASC: *Time in the Solar System,* Bradley Observatory
- March 28, 2003, William A. Calder, Equinox Concert, Bradley Observatory (Co-sponsored by the Department of Music)
- April 11, 2003, Guy Consolmagno (Vatican Observatory): *Astronomy, God, and the Search for Elegance,* Bradley Observatory (Co-sponsored by Department of Religious Studies)
- May 9, 2003, Chris De Pree, ASC: *You are Here (The Big Picture),* Bradley Observatory

David Dundee
Fernbank Science Center
Atlanta, Georgia

Left: Logo from the Centennial of Flight Website <http://fsc.fernbank.edu/>



Gary Lazich, Manager
Russel C. Davis
Planetarium
Jackson, Mississippi

[Since Southern Skies *has not had any news from Mississippi since 1997, Gary decided to submit this clever "that was then; this is now" report as a personal letter to me. Text in the regular font is old information while text in italics is current information. —Ed]*

Russel C. Davis Planetarium, Jackson

Dear Duncan,

Happy Hanukkah/Merry Christmas/Happy New Year/Joyous Epiphany! (I believe that covers it.) I hope all is well with you. *(I always have and still do. Judging from the article your senior intern wrote, your internship program is flourishing.)*

Thanks for the "typs" on typography. I check my documents routinely for the errors you describe. *(I have forgotten what those "typs" were but believe they had to do with spacing after sentences and such.)*

Russell C. Davis Planetarium in Jackson *(Yes, Virginia, there* ***are*** *planetariums in Mississippi!)* extended its Christmas features *Season of Light, The Alien Who Stole Christmas,* and *Laser Visions: A Fresh Aire Christmas* through January 7 to keep in phase with Jackson school holidays. *(We still do. These same features will run through January 5. After theater maintenance and lobby refurbishment, we re-opened on January 13 with* ***Our Home in the Milky Way*** *as our main feature and* ***In My Backyard*** *as our family feature. We offer* ***Skies Alive!,*** *a monthly live program that includes telescope observing. In April we will reprise* ***Rusty Rocket's Last Blast*** *with* ***Catch a Falling Star****—the NASA Stardust program—to coincide with an exhibition of a Stardust scale model and a Space Day celebration on May 3.*

The Davis Planetarium Foundation continues to seek funding for an 8-perforation/70mm film system for wide-screen/hemispheric projection and plans to have the system installed and operational by early June. *(We didn't actually acquire 8/70 projection capability until 2000 when the City of Jackson contracted with MEGASystems, Inc. for installation. We opened in September 2000 with* ***Africa: The Serengeti*** *and followed it with* ***Search for the Great Sharks, Across the Sea of Time, Thrill Ride,*** *and* ***Ultimate Gs.*** *We will be showing* ***Michael Jordan to the MAX*** *and* ***Whales*** *until April, when we premiere* ***Grand Canyon: The Hidden Secrets.*** *Collaboration with several other organizations on Jordan yielded cross-marketing and television advertising. Go to <http://www.gomiss.com> and click on Entertainment for current information on Planetarium films and features.)*

(The Foundation that spearheaded efforts to acquire large format films now enjoys neither the credit nor the profit. In 1997 it changed its name to Mississippi Science Network and expanded its mission to embrace statewide science education reform in response to the mayor's desire to privatize the planetarium. A subsequent election yielded a mayor who had no desire to privatize and a department director who had great misgivings about a private foundation's involvement in a city facility. The resulting negotiations led to a virtual divorce between the Network and the City just a month after 8/70 films opened.)

In February the Planetarium will reprise… its own country laser show ***Bright Lights, Big Country*** to coincide with The Dixie National Rodeo…. The production staff, energized by their participation in the International Laser Display Conference in Miami, is working on a second original program featuring selected hits from Michael Jackson's ***HIStory*** for a March premiere. *(Assisted by the Network, Planetarium staff members went on to produce two more original laser programs featuring medleys of alternative rock and dance music. The absence of a private organization that can obtain sponsors for laser programs coupled with the lack of a staff artist has suspended original production.)*

Mississippi Student Space Station™, a project of the Davis Planetarium Foundation in Jackson, will expand to include two missions this summer (June 15 – 28 and July 6 – 19). Students will participate in demonstration and laboratory activities involving mathematics, astronomy, physics, chemistry, and computers. Each student will also choose an area of specialization from among human physiology, planetary science, botany, microbiology, and material science/aerospace engineering. Students train for the first ten days of their residency and develop creative thinking and team-building skills. During the last four days, eight students conduct experiments in *Athena,* a space station simulator, during a 96-hour mission while the remaining twenty-four students rotate through Mission Control duty shifts. *(The Network suspended missions after 1997 and began seeking funding to replace equipment and facilities considered state-of-the-art in 1988 that have grown increasingly obsolete. City efforts to obtain funds from the National Science Foundation and private foundations for facility upgrade and outreach programming have not yet yielded any support.)*

Rainwater Observatory & Planetarium, French Camp

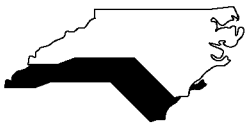
The Rainwater Observatory and Planetarium in French Camp can now present planetarium programs under a 16' perforated aluminum dome using a Spitz A-2 projector purchased from the University of Wisconsin's Washburn Observatory. Director Jim Hill serves both as Solar System Ambassador and Solar System Educator for JPL in Mississippi. NASA Space Grants and a V. M. Slipher grant have enabled him to present informal Backyard Astronomy classes throughout northern and central Mississippi. (He envisions a statewide network of astronomy educators who can present the classes.) The next Mid-South Stargaze will take place April 23 – 26 with its usual feast of guest speakers, telescopes, and some of the darkest skies in Mississippi. (Last year's Stargaze drew some 225 people.) Even better—the cows in the surrounding pasture are rambling elsewhere now, leaving the Observatory grounds free of UFOs (Unidentified Foul-smelling Objects). Of course, we still have to watch out for fire ants… Point your browser to <http://rainwater.astronomers.org> for current information.

SciWorks Planetarium Winston-Salem

We're currently planning some public observation sessions. We're going to be doing a Saturn observation as part of the (SOC) or Saturn Observation Campaign. We'll turn off the lights in the parking lot and invite the public to witness the ringed planet first hand.

Later in the spring, we hope to get the folks out again for the May 15th lunar eclipse. We're also working with the rest of the education department in the preparation and implementation of some new summer camp programs. For our spring public weekend show run, we're presenting *Cardboard Rocket, Planet Patrol,* and *WSKY, Radio Station to the Stars!*

Our current operation will likely remain about the same even as we move into the new fiscal year in July. We asked Santa for a new bright comet in the New Year but have not yet received one. It was supposed to be about 1st magnitude and be visible for about 2 – 3 hours just after sunset for several months. If anyone got our comet by mistake, just forward the coordinates to us, and we'll send you something to make it worth your while!



Ralph White
SciWorks Planetarium
Winston-Salem,
North Carolina

Dupont Planetarium

The Dupont Planetarium at the University of South Carolina Aiken showed the Christmas favorite, *'Tis the Season* during the recent holidays. This show continues to be one of our most popular. There are a number of local groups that return year after year, making a visit to the planetarium an annual holiday event. The show for January 2003 is *The Explorers of Mauna Kea* and for February, the show is *Follow the Drinking Gourd.*

The Ruth Patrick Science Education Center Observatory recently completed a renovation project. The observatory houses the Bechtel Telescope, which is a 16" Meade LX-200 mounted on a permanent pier. The height of the telescope made viewing objects nearer the horizon impossible. A base was constructed for the pier in early 2002. The final component to be installed was the raised floor, which allows visitors to observe without having to climb a ladder too far.

The Dupont Planetarium and the Augusta, Georgia astronomy club hosted their annual fall star party on November 15, 2002. A variety of hands-on activities were offered in addition to planetarium shows. Unfortunately, it was a cloudy evening. Happily, however, we still had over 300 people attend the event.

Hooper Planetarium, Roper Mt. Science Center

We have finally completed our new Conference Center which includes an Observatory Annex lower level. As part of this, we have built a new classroom, and a wonderful well equipped shop for maintaining the big Princeton refractor. Needless to say, what leisure time I can find is spent in the shop. In the Hooper Planetarium we have opened an in-house production, *Life Cycles with Iggy and Roper.* It is aimed at a second-grade audience. The program involves some original Digistar programming by our Educator/Technician, Gavin Hoffman, and an original script and soundtrack. Our public programs resumed on Friday evenings following the holidays. We hosted an astronomy club planet watch near the end of January. We look forward to visits by any SEPA members traveling the I-85 corridor.

Settlemyre Planetarium

We had a good Christmas season running *Season of Light.* We are preparing for the return of all the school children as well as Black History Month. We will be featuring *Follow the Drinking Gourd.* We will also be showing *Star Stealers* and *Explorers of Mauna Kea.* Hope everyone had a nice holiday.

Glann Dantzler
Settlemyre Planetarium
Rock Hill, South Carolina

Clarence T. Jones Planetarium, Chattanooga

Jack Pitkin reports: I am Operations Manager of the Jones Observatory at the University of Tennessee at Chattanooga. We have a 30 seat planetarium connected with the observatory. We are open to the public on Sunday nights from 5:30 – 8:30, and offer planetarium shows and telescope viewing. We finished our fall 2002 season on December 15. We will begin our spring 2003 season on January 19 and run until April 20. We are usually closed during the summer.

Bays Mountain Planetarium, Kingsport

The year at Bays Mountain ended with the final public performances of our in-house production *SpaceFlight—The Early Years.* This "Right Stuff" style program gave audiences a look at the U.S. and Soviet manned space efforts from Sputnik to the end of the Apollo moon landings. Plans are to keep the show installed for school groups, especially those looking for an activity during Tennessee Space Week in late January of each year.

Kicking off the new year the planetarium is offering *Secrets of Taurus.* This show allows audiences the opportunity to see how many neat things there are regarding a single constellation. It includes some mythology, casual stargazing, and scientific findings regarding the stars and clusters that make up the figure.

In other news, Adam Thanz has been providing an ongoing telecourse in astronomy for a local community college. He holds the course on a tri-weekly format where the students get to hear lectures, do laboratory exercises, and take tests. The student is responsible for most of the learning on their own by watching "Nova" style videos on astronomy and by reading the textbook. This allows the students who cannot attend a semi-daily course to get college credit on their own schedule. Students appreciate having the

Jim Greenhouse
Sharpe Planetarium
Memphis, Tennessee

Jim Greenhouse
Sharpe Planetarium
Memphis, Tennessee

six regular sessions with a real person to enhance and clarify the material they have reviewed on their own. They keep asking Adam back so he must be doing a great job.

Mike Chesman reports that word is starting to trickle out regarding their *Friendly Stars* DVD planetarium show kit. Eight facilities from New York to California have already started using the program. The program was originally to be unveiled at Baton Rouge in 2002. Those that might want to get information about the program can check out Bays Mountain's web pages at <http://www.baysmountain.com/planetdept/astronomy.html>. An all-sky video version of the show is also being discussed with Jack Dunn. In addition to Bays Mountain Planetarium, the program is available through Jon Frantz at ECCS or George Fleenor at GeoGraphics.

Sharpe Planetarium, Memphis

After a slow summer, the planetarium's business picked up in August. The annual *Elvis, Legacy in Light* laser show recorded very high attendance as an activity during the 25th anniversary of The King's death. Many of the shows "regulars" admitted through their tears that this year's production was the best they had seen. The *Holiday Laser Spectacular* also enjoyed much higher than anticipated attendance since the Pink Palace Museum became the new home of a Memphis holiday tradition: The Enchanted Forest display.

The planetarium opened *Greatest Places in the Universe* in January. In April, we will start an original production featuring astronomical special events like meteor showers, comets, eclipses, and conjunctions. The show is being written in such a way that each part can be shown independently during an event or all of them together make a full-length show.

The How to Use Your Telescope workshops where such a success that an extra season was added. On April 12, the normally scheduled monthly telescopic observing will be combined with the Yuri's Night World Space Party. The activity will be held at the Lichterman Nature Center.

Kathey Nix rewrote a segment in *Greatest Places…* to bring it up to date for a second run. Jim Greenhouse is settling in as the planetarium's new supervisor. Edwin Faughn had one of his works of art published on the cover of a special issue of *Scientific American.* Roy Foppiano used a new CCD camera he got at a workshop conducted by the Rainwater Observatory to record images of the Leonid Meteor Shower. Alex Eilers moved her NASA resource center to a closet in the planetarium lobby so that teachers do not have to keep banging their heads on the projector shelf behind the dome. After the success of his productions, our laserist, Ben "Jammin" Hudgens, decided to retire on a high note and is moving to Texas. Over the last several months, some of the planetarium staff have suffered illnesses or have family members who are sick. Please keep the families of the Sharpe Planetarium staff in your prayers.

Craigmont Planetarium, Memphis

Planetarium Instructor Donna Rhodes Thomas is teaching astronomy labs on Wednesday evenings at her namesake, Rhodes College. Although there is no family connection between Donna and the college, she is honored to be teaching at one of America's premier liberal arts colleges. The Astronomy lecture portion of the course is taught through the college's physics department during the day, while Donna takes care of her regular duties at the planetarium. In the evening, four sections of lab are taught allowing for observations using, among other lab equipment, the school's 36 cm telescope. Donna has been teaching a single section of the lab for the past three years and this year was asked to teach a second section.

Duncan Teague is learning InDesign, the new page composition program Adobe developed to replace the venerable PageMaker he has been using for 15 years to layout both our *Skylights* newsletter and *Southern Skies* journal. It may take a while to feel comfortable with the new software. Procedures that used to be second nature now require concentration due to the learning curve with InDesign. He hopes SEPA members won't be able to tell much difference between the previous issue of *Southern Skies* and the current one.

Curt Spivey
Avampato Discovery Museum
Charleston, West Virginia

Sunrise Museum Planetarium, Charleston

Sunrise Museum in Charleston closed its doors for good on December 29. Our new facility, the Avampato Discovery Museum in the Clay Center for the Arts and Sciences is scheduled to open in late February. I suppose there may be an Easter Bunny, too.

At this writing, our new 61' dome is being installed. There were two delays that kept it from starting in September: the contractors forgot the knee wall, and the railing for the access stairway bisected the dome support at seven spots! Both issues have been rectified, and we anticipate installation soon.

The Electric Sky Theater will feature 175 seats, a Spitz StarScape star ball, and Electric Sky capability similar to Rauch in Louisville. It will also house a Megasystems 870 projector and surround sound system, and an LFI 4505 laser. It will be the only large format film theater in West Virginia, and one of only two facilities doing laser shows on a regular basis (Olgebay Park in Wheeling is the other).

I'll miss our little 40-year-old A3 and 24 foot dome with wooden benches. There is a school about an hour northeast of Charleston that has expressed an interest in buying it if they can raise the money. I hope it does find a good home.

Hopefully, we will be fully up and running by the spring issue of Southern Skies. Stop by and see us if you're in the neighborhood!

106 Worlds and Counting

Andrea Finley
Senior Intern
Craigmont Planetarium
Memphis, Tennessee

Over the years planetarium staff have told audiences there are approximately 60 moons in our solar system. Astronomers have recently discovered nearly four dozen new irregular worlds, bringing the total number of moons in our solar system to a startling 106. The satellites that orbit the nine planets are often more interesting than the planets themselves.

Jupiter's Io has several active volcanoes that spew out sulfur dioxide "snow." Apart from Earth, Europa is the most likely place in the solar system to find living organisms.

Ganymede is the largest satellite in the solar system. With a diameter of 3270 miles, it's larger than Mercury and Pluto, and three-quarters the size of Mars. Callisto is covered with myriad craters, gigantic impact basins, ancient tectonic features, and suggestions of volcanism.

Saturn's moon Enceladus has impact craters up to 22 miles in diameter; other areas are smooth. One side of Iapetus is very dark; the other side, light.

Titan is the largest of Saturn's moons. It is the second largest satellite in the solar system and the only one that's known to have a dense atmosphere.

Miranda is the innermost of the large Uranian moons. Its surface is composed mostly of rolling cratered plains that probably date back to the early evolution of the solar system when impact rates were extremely high.

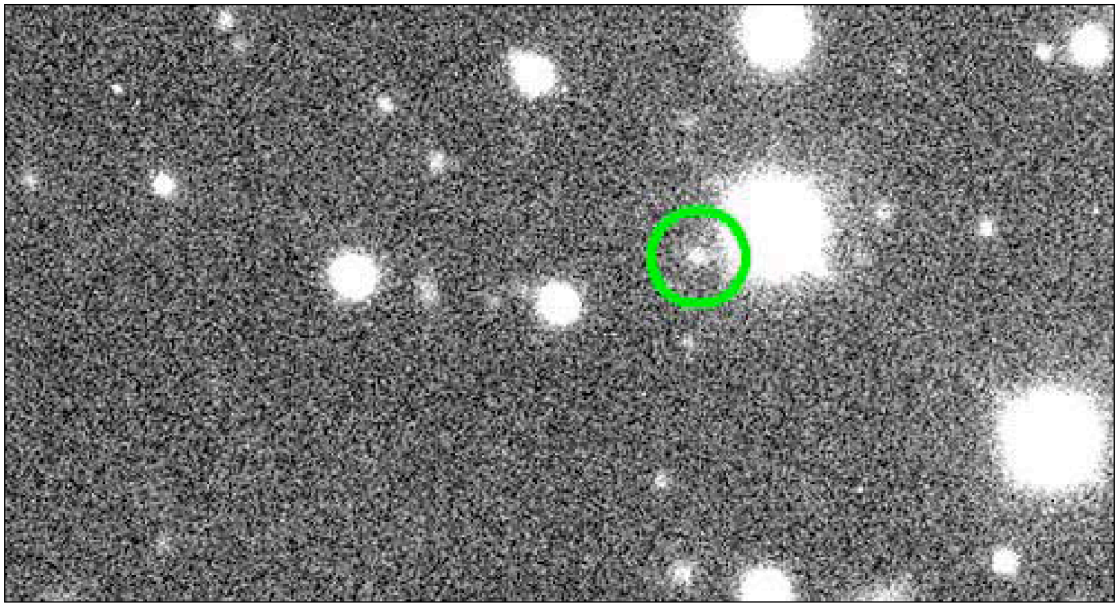
Neptune's Triton is the only large moon in the solar system with a retrograde orbit—moving opposite the direction of rotation of the planet. Triton also has a density about twice that of water. This means Triton has more rock in its interior than the icy satellites of Saturn and Uranus.

Discoveries of many irregular moons over the past two years have increased the number of natural satellites of the planets to a mind boggling total of 106. These irregular moons have elliptical, retrograde orbits that are steeply inclined to the parent planet's equator. And they're tiny—1.2 – 2.4 miles in diameter.

Jupiter leads the pack with 40 known moons. The most recent discovery of a Jovian satellite was October 31, 2002. Saturn is second with 30 moons. Uranus has 21; Neptune, 11; Mars, two; and Earth and Pluto, one each.

Some think these new worlds may be asteroids captured by the gravity of the gas giant planets. Others think they may have become moons at the time of the formation of the solar system.

Left: (clockwise), Ganymede, Callisto, Io, and Europa
Below: One of Jupiter's new irregular *moons recently discovered by the Hubble Space Telescope.*



HST's Greatest Hits '96

Duncan Teague
D T Publishing
3308 Bluemont Drive
Memphis, Tennessee
38134-8454

The Space Telescope Science Institute (STScI) provided slides of Hubble images to individuals within regional affiliates who arranged 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 $50.00, including postage and handling. Send your check or purchase order to the address at the left.

01a___Hubble's deepest ever view of the universe, revealing 1,500+ extremely faint galaxies in various stages of their development
01b___Sample galaxies from the same Hubble deep field
02____The inner region of a warped dust disk around Beta Pictoris once hidden because of the star's glare
03____An image of the Egg Nebula taken by WFPC2; it shows the emergence of some mysterious searchlight beams emanating from behind a dying star
04____The first direct image of a star other than the Sun: Betelgeuse.
05____In more detail than has ever been seen before, the process a star like the Sun goes through when it dies
09a___In clear, detailed pictures the first ever images of Pluto's surface; four views
09b___Pluto surface map
10____Gravitational lens effect captures image of primeval galaxy
11____Images of the globular cluster Mayall II, consisting of 300,000 old stars, in orbit around the Andromeda galaxy
13a___The Helix Nebula, NGC 7293 showing the collision of gases near a dying star
13b___Helix Nebula detail with cometary knots surrounding the dying star
14____A view of Comet Hyakutake that focuses on the near-nucleus region of the comet
15____Three layers of Uranus's atmosphere taken with infrared filters; both clear and hazy layers created by a mixture of gases
16____Image taken of Saturn where its rings appear edge-on because of the position of the Earth in Saturn's orbital plane
17____A view of several star generations found in the central region of the Whirpool Galaxy
18a___A rare view of Saturn's rings seen just after the Sun had set below the ring plane
18b___A series of 10 images of several small moons orbiting Saturn
21a___NGC 1365, a barred spiral galaxy located in the Fornax cluster
21b___NGC 4639, a spiral galaxy located in the Virgo cluster
22a___The Crab Nebula and a detail of the pulsar in its center
22b___Sequence of three images showing changes in the Crab Nebula pulsar
23a___Huge, billowing pair of gas and dust clouds in Eta Carinae
23b___Expansion of Eta Carinae debris
25____Hubble's 100,000th exposure captures an image of a distant quasar
27____A vast nebula, NGC 604, which is known for a great starbirth region
29a___18 gigantic star clusters which may be building blocks for a new galaxy
29b___Blue sub-galactic clumps which may be galaxies under construction
30____Jupiter's moon Io passing above turbulent clouds
31____Clusters of stars and a fishhook-shaped cloud of gases found in NGC2366, a giant star forming region
32____Changes in Jupiter's auroral emissions
33____Views of weather on opposite hemispheres of Neptune
34____A Martian dust storm around the edge of the north polar cap
35a___A survey of quasar host galaxies
35b___A quasar caught in the act of colliding with its companion galaxy
36a___Supersonic comet-like objects in the Cartwheel Galaxy
36b___Cartwheel Galaxy composite image
36c___Cartwheel Galaxy illustration
38a___M8, the Lagoon Nebula showing giant "twisters" and star wisps
38b___M8, the Lagoon Nebula detail showing eerie funnels and twisted-rope structures

HST's Greatest Hits '97

Duncan Teague
D T Publishing
3308 Bluemont Drive
Memphis, Tennessee
38134-8454

The Space Telescope Science Institute (STScI) provided slides of Hubble images to individuals within regional affiliates who arranged 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 39 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 at the right.

01____Central supermassive black holes in galaxies NGC 3377, NGC 3379, and NGC 4486B:
03____SN1987A Fireball: One tenth light year long dumbbell structure expanding at six million miles per hour in supernova 1987A
08____Changes in the nucleus of Comet Hale-Bopp as it moved closer to the Sun beginning in the September of 1995
09a___Transition from spring and summer in Mars's northern hemisphere; photo taken shortly before opposition
09b___Three photos of Mars taken six hours apart with 90° difference between images; photos taken shortly before opposition
11____The Egg nebula in which stars are born and die violently; the photo shows jets of gas being blasted into space
12____A supermassive black hole located in galaxy M84
13____NICMOS captures a region of the Orion nebula filled with action as a center for the birth of new stars
14____Supernova 1987A: different colors represent different elements in the ring
15a___A view of Mars's cloud cover
15b___Seasonal changes in Mars's northern polar ice cap
15c___Four views of Mars rotated 90° between images during summer in Mars's northern hemisphere
16____The Cone Nebula: six baby sun-like stars surround their mother
17____A collision between two spiral galaxies in the heart of galaxy Arp 220
18____Fireworks near a black hole in the core of Seyfert galaxy NGC 4151
19____STIS reveals an invisible high-speed collision around a supernova
20____Hubble pinpoints the optical counterparts of a γ-ray burst in a distant galaxy
21____Hubble captures a volcanic eruption plume from Jupiter's moon Io
22____A gamma-ray burst blazes from a titanic explosion in deep space
23____Hubble's look at Mars shows a canyon dust storm, cloudy conditions for Pathfinder's landing in July 1997
24a___Dissipation of a large dust storm on Mars
24b___Hubble shows dust and water ice clouds that exhibit substantial daily variations
25____Powerful telescopes discover the largest galaxy in the universe
26____Hubble separates components in the Mira binary star system
27____Hubble reveals a 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 γ-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
34a___Hubble reveals some stellar fireworks accompanying galaxy collisions
34b___Detailed images of colliding galaxies
35____Hubble shows images of a blue straggler star
36a___Hubble tracks clouds on Uranus
36b___Hubble spots northern hemispheric clouds on Uranus
37____Hubble shows infrared view of a moon, the ring, and the clouds of Jupiter
38a___Hubble sees a supersonic exhaust from a nebula
38b___Hubble's planetary nebula gallery

HST's Greatest Hits '98

Duncan Teague
D T Publishing
3308 Bluemont Drive
Memphis, Tennessee
38134-8454

The Space Telescope Science Institute (STScI) provided slides of Hubble images to individuals within regional affiliates who arranged 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 1998. Numbers next to the descriptions are shortened versions of STScI press release numbers, *e.g.,* 26a refers to PR 98-26a.

The entire set of 40 slides is $50.00, including postage and handling. Send your check or purchase order to the address at the left.

01____COBE's infrared view of the Universe: three maps of the full sky seen in infrared light
02____Distant supernovae: light sources determine the universe's expansion rate
03____Beta Pictoris: disk indicates planets, and possible brown dwarf companion
04____Jupiter aurorae: a "curtain" of light extends several hundred miles beyond Jupiter's limb
05____Saturn's aurorae: "curtains" of light extend 1,000 miles above cloud tops
08____Supernova 1987A: a collision between the expanding blast wave and its circumstellar ring
10____Serendipitous asteroids: HST images show curved trails of asteroids
11a___Planetary nebula NGC 7027: a brief stage in the evolution of a medium mass star
11b___The Cotton Candy Nebula and The Silkworm Nebula: phases of stellar burnout
12____Star birth in barred spiral galaxy NGC 1808 possibly due to interaction with NGC 1792
14a___Centaurus A: nearest active galaxy to Earth shows the turbulent firestorm of starbirth
14b___Centaurus A: tilted disk of gas at the galaxy's core surrounds suspected black hole
15____Stingray Nebula: Henize 1357, the youngest known planetary nebula
16____NGC 1818: globular cluster of over 20,000 stars in the Large Magellanic Cloud
17a___GRB 971214: γ-ray burst; most energetic event in the universe
17b___GRB 971214: γ-ray burst; comparison of Keck Telescope and HST views
18____Saturn: details of the clouds and hazes in the atmosphere of the ringed planet
19____Possibly the first extrasolar planet ever to be imaged orbiting about a newborn binary star
20____Four of NASA's proposed designs for the Next Generation Space Telescope (NGST)
21____Galaxy NGC 4314: bright ring of starbirth around the galaxy's core
22____NGC7052: galaxy with 300 million solar mass black hole in its center
25____N81 in the Small Magellanic Cloud: a celestial maternity ward
26a___Galaxy Cluster MS1054-03321: thousands of galaxies eight billion light years from the Earth
26b___Supernova 1996CL: a March 1996 exploding star in galaxy cluster MS1054-0321
27____Distant galaxy clusters: left, in Virgo; upper right, in Andromeda; lower right, in Taurus
28____NGC7742: a small Seyfert 2 active galaxy probably powered by a black hole in its core
29____Saturn: pastel yellows, browns, and greys distinguish cloud differences
30____Sagittarius Star Cloud: HST peers into the heart of the Milky Way
31____NGC7635, the Bubble Nebula: shows an expanding shell of glowing gas surrounding a hot star
32a___Infrared views: left: faintest galaxies ever seen; right: objects 12 billion light years away
32b___Deep field galaxy: left: visible light areas of starbirth; right, infrared disk structure
34____Neptune: a look at the eighth planet's stormy disposition
35____Uranus, August 8, 1998: its four major rings and 10 of its 17 currently known satellites; false color image
36____NGC6210 planetary nebula described as looking like a turtle swallowing a sea shell
37____Quasar PG1115+080 and the gravitational lens effect:
38____Nebula M1-67 around star WR124: gas ejected into space at 100,000 mph
39____NGC3132: southern hemisphere's "Eight-Burst" or "Southern Ring" Nebula
41a___HST deep field south: thousands of galaxies in Tucana, near the South Celestial Pole
41b___HST deep field south: infrared, visible light, and ultraviolet views of distant galaxies
42____NGC253 galaxy: edge-on spiral galaxy just beyond our Local Group

HST's Greatest Hits '99

Duncan Teague
D T Publishing
3308 Bluemont Drive
Memphis, Tennessee
38134-8454

The Space Telescope Science Institute (STScI) provided slides of Hubble images to individuals within regional affiliates who arranged 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 42 images distributed in 1999. Numbers next to the descriptions are shortened versions of STScI press release numbers, *e.g.,* 43a refers to PR 99-43a.

The entire set of 42 slides is $52.50, including postage and handling. Send your check or purchase order to the address at right.

01____M57 Ring Nebula: the sharpest view yet of this planetary nebula
02____Combined deep view of infrared and visible light galaxies
03____HD141569: stellar dust rings of a star in the constellation Libra
04____SNH1987A: the self-destruction of a massive star in the Large Magellanic Cloud
05a___Six images of a young stellar disk found in the constellation Taurus
05b___Four images featuring disks around various young stars in Taurus
06____NGC1316: the silhouette of dark clouds against a glowing nucleus of an elliptical galaxy
07____Mars: visible, infrared light images; evidence of water bearing minerals
08____Proxima Centauri: a detailed image of the Sun's nearest stellar neighbor
09____GRB990123: fading visible light fire ball in a γ-ray burster
10____Six images showcasing different views of spiral galaxies
12____Tarantula Nebula: multiple generations of stars in the brillant cluster of Hodge 301
13____Jupiter: images of the volatile moon Io sweeping across Jupiter's face
14____Copernicus: the 58 mile wide (93 km) impact crater on the Moon
16____NGC4650A: a polar ring galaxy
18____Rings, arcs, and crosses as seen in Hubble's top ten gravitational lens effect images
19____NGC4603: magnificent spiral galaxy associated with the Centaurus cluster
20____NGC3603: various stages of the life cycle of stars in a giant galactic nebula
21____AB Aurigae: a swirling disk of dust and gas surrounding a developing star
22____Mars: a colossal polar cyclone
23____N159: a turbulent cauldron of starbirth in the Large Magellanic Cloud
25____NGC4414: magnificent details in the dusty spiral galaxy
26____NGC6093: a stellar swarm in a dense globular cluster
27____Mars: the red planet at opposition during April – May, 1999
28____MS1054-03: galaxy collisions in distant clusters
29____Jupiter: an ancient storm in its atmosphere (The Great Red Spot)
30____Giant star clusters near the galactic center
31____HCG 87: a minuet of four galaxies
32____HE2-104: small, bright nebula embedded in the center of a larger nebula
33a___R136 in 30 Doradus: a grand view of the birth of stars
33b___R136 in 30 Doradus: two detailed views of a highly active region of star birth
34a___NGC1365: a barred spiral galaxy reveals a bulge in its center
34b___Eight different views of the central bulges of spiral galaxies
35____HH32: a magnificent example of a "Herbig-Haro object"
36____NGC2261: Hubble's variable nebula illuminated by R Monocerotis (R Mon)
37____NGC2346: a butterfly shaped nebula
38____NGC2440: planetary nebula ejected from a dying star
39____OH231.8+4.2: the "rotten egg" nebula
40____M32: hot blue stars deep inside a dwarf elliptical galaxy
41____NGC2207 and IC2163: two spiral galaxies passing by each other
42____M20: Trifid Nebula reveals stellar nursery torn apart
43a___M87: the jet near the galaxy's central black hole

JPL's Best Images of '98

Duncan Teague
D T Publishing
3308 Bluemont Drive
Memphis, Tennessee
38134-8454

NASA JPL has sent us the following slides for the Galileo Mission and others. Slides are $1.25 each on both the current page and the following page.

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	Infared 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 Mountains
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 moment of Closest Approach
P-44131	Ida and Dactyl: Enhanced Color
P-44297	High Resolution View of Dactyl
P-44520	Asteroid Ida Rotation Sequence
P-44542	Comet Shoemaker-Levy 9 Fragment W Impact on Jupiter
P-47058	Ganymede: Comparison of Voyager and Galileo Resolution
P-47065	Ganymede: Mixture of Terrains and Large Impact Crater in Unuk Sulcus Region
P-47162	Full Disk Views of Io (Natural and Enhanced Color)
P-47179	Three Views of Io
P-47182	Jupiter's Great Red Spot
P-47183	Dark Bands on Europa
P-47194	Live volcano on Io
P-47196	False Color Great Red Spot
P-47903	NIMS Ganymede Surface Map
P-47905	Five Color Views of Io
P-47906	Europa In Color
P-47935	Io Glowing in the Dark
P-47961	Ganymede's Nippur Sulcus
P-47970	Ganymede Color Global
P-47971	Io in front of Jupiter
P-47972	Changing Volcanoes on Io
P-48035	Stereo View of Ganymede's Galileo Region
P-48040	Natural and False Color Views of Europa
P-48063	Thunderheads on Jupiter
P-48112	Ganymede Uruk Sulcus High Resolution Mosaic Shown in Context
P-48113	Ganymede Galileo Regio High Resolution Mosaic Shown in Context
P-48114	Jupiter's Great Red Spot
P-48122	Two views of Jupiter's Great Red Spot
P-48127	Ridges on Europa
P-48145	Io: Volcanically Active Regions
P-48188	The Main of Ring of Jupiter
P-48231	Callisto Crater Chain at High Resolution Shown in Context
P-48236	Europa: Ice Floes
P-48293	Callisto: Scarp Mosaic
P-48294	False Color Mosaic of Jupiter's Belt-Zone Boundary
P-48299	Asgard Scarp Mosaic
P-48445	True Color Mosaic of Jupiter's Belt-Zone Boundary
P-48496	Color Global Mosaic of Io
P-48526	Europa Ice Rafts
P-48527	Closeup of Europa's Surface
P-48532	Mosaic of Europa's Ridges, Craters
P-48584	Io's Sodium Cloud
P-48698	E4 True and False Color Hot Spot Mosaic
P-48700	Jupiter Equatorial Region
P-48952	Jupiter's White Ovals, True and False Color
P-48954	Ancient Impact Basin on Europa
P-48956	Active Volcanic Plumes On Io
P-49344	Arizona-sized Io Eruption
P-49434	Europa: Ice Rafting View
P-49435	High Resoultion Mosaic of Ridges, Plains, and Mountains on Europa
P-49436	Regional Mosaic of Chaos and Gray Band on Europa

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

JPL's Best Images of '99

Duncan Teague
D T Publishing
3308 Bluemont Drive
Memphis, Tennessee
38134-8454

JPL-19-12 NASA/JPL
JPL-25125 Model of Sojourner
JPL-27089AC Cassini arrival and orbit
JPL-27089BC Cassini interplanetary trajectory
JPL-27748 Thermal vacuum testing
JPL-28046BC High-gain antenna
JPL-28162AC Cassini assembly
MGS-001 Scientists assemble MGS
MGS-002 Scientists assemble MGS
MGS-003 MGS configuration
MGS-004 MGS orbit around Mars
MGS-005 Launch of MGS
P-23062 Saturnian clouds
P-23209 The Saturn System
P-23925 Saturn ring spokes
P-41101 Huygens descent profile
P-42810AAC Huygens, exploded view
P-42810AC Huygens probe interior
P-43538 Saturn: Rings and Moons
P-43560 Mars global view
P-43836 Scientists' home countries
P-43862 Pathfinder landing
P-43966AC Spacecraft, country flags
P-44233 Mars landing area
P-44293Ac Cruise stage
P-45424 Huygens probe release
P-45893AC Saturn, Titan's landscape
P-46225AC Mapping Titan
P-46278 The Cassini mural
P-46356 Cassini with Huygens
P-46427 Petal deployment, Mars Yard
P-46428 Airbag inflation test
P-46506AC Saturn as seen from Rhea
P-46507 Saturn orbit insertion
P-46507AC Cassini enters Saturn orbit
P-46586 Cassini orbital tour
P-46620 Pathfinder landing
P-46655 Science targets
P-46656 Enceladus and Iapetus
P-46898BC Cassini's trajectory
P-47340AC Propulsion module
P-47936CC Huygens probe installation
P-47991 Pathfinder arrival at KSC
P-47992Ac Cruise stack arrival at KSC
P-47992Bc Sojourner checking at KSC
P-48012DC Transporting Cassini
P-48045BC Cassini fully assembled
P-48045CC Ready for transport
P-48154Bc Pathfinder mated to rocket
P-48155Ac Launch 12/4/96, 2:11 a.m.
P-48155Bc Petal closing at KSC
P-48156 Full stack mated to booster
P-48313BC Cassini in the space center
P-48505AC Huygens probe
P-48505BC Huygens probe
P-48565 Titan IV launch
P-48597 Cassini ready for shipment
P-48630 Saturn tour trajectory
P-48664 Cruise stage at KSC
P-48702 Pathfinder on Mars
P-48707 Cruise stage, spacecraft
P-48753 E.D.L. sequence
P-48824 Sojourner and Pathfinder
P-48827 The airbags by Sojourner
P-48841 Sojourner touchdown
P-48842 APXS studies "Barnacle Bill"
P-48845 "Twin Peaks"
P-48847 The rock "Yogi"
P-48866 "Barnacle Bill" mosaic
P-48871 Rover's APXS at work
P-48877 "Wedge" and "Flattop"
P-48878 Near "Barnacle Bill"
P-48889 "Barnacle Bill" and "Yogi"
P-48891 360° b&w panorama
P-48893 "Yogi" and rover tracks
P-48894 Sagan Memorial Station
P-48901 Sojourner wheelie on "Yogi"
P-48902 Rover's view of rocks, lander
P-48908 The "Rock Garden"
P-48909 Martian terrain, "Wedge"
P-48911 Sojourner, "Wedge"
P-48912 Forward ramp Twin Peaks
P-48913 The "Rock Garden"
P-48914 A closer view
P-48915 The rover petal
P-48916 Twin Peaks
P-48917 Martian terrain
P-48918 "Barnacle Bill," "Yogi," "Couch"
P-48919 Sojourner, "Barnacle Bill"
P-48920 "Couch" on the horizon
P-48921 The rock "Yogi"
P-48922 Airbags, petal, and "Yogi"
P-48923 Martian landscape
P-48924 "Calvin" and "Hobbes"
P-48925 "Calvin" and "Hobbes"
P-48926 Martian terrain
P-48927 Petal and terrain
P-48928 "Little Matterhorn"
P-48931 New 360° gallery panorama
P-48970 North Twin Peak
P-48982 The forward ramp
P-49025 Airbag bounce marks
P-49026 Airbag roll marks
P-49028 Classes of Martian rocks
P-49029 Classes of Martian rocks

Planetarium Obscura:

The Camera Obscura in a Planetarium

Gary Senn
Dupont Planetarium
Aiken, South Carolina

The term "camera obscura" is derived from the Latin, "camera," which means "room" and "obscura," which means "dark." The classic camera obscura is a dark room with a hole on one side. The wall opposite from the hole displays an inverted image of the area outside of the room. A "planetarium" can be defined as a "room." A special application of a camera obscura is a planetarium obscura, if one is willing to put a hole in one side of the planetarium "room." Personnel at the University of South Carolina Aiken were willing to put a hole in one side of a planetarium making the Dupont Planetarium the only known "planetarium obscura" in the world.

Historically, there have been three main applications for the camera obscura: recreation, image capture, and science. The first description of the concept of the camera obscura is often attributed to Aristotle. He noted the changing shape of a solar eclipse projected on the ground through holes in leaves. There is no evidence that Aristotle used a camera obscura but his observation of a solar eclipse was a precursor to one of the main uses of camera obscuras. It was actually the Chinese who were the first to document a camera obscura. The philosopher, Mo Ti, first described the camera obscura in the 5th century B.C. Mo Ti provided an explanation of the inverted image formed by the camera obscura and used the analogy of an oar in an oarlock to describe how the image was transformed. This was in contrast to Aristotle who did not offer an explanation for the camera obscura observations he made.

Recreational uses for camera obscuras were found commonly in the 16th through 19th centuries. Camera obscuras were erected in public areas and visitors were invited to attend a "show" in the chamber. The camera obscura offered a live image in full color and full motion. This provided early camera obscura patrons with a "pre" cinema experience that predated motion pictures by hundreds of years.

Most of the recreational camera obscuras used mirrors and lenses to form sharp images that could be viewed without the nuisance of being inverted. Many camera obscuras were constructed as portable tents. A lens and a mirror were placed at the top of the tent, which projected an image onto a table. These portable tents were taken from place to place and used as an income source for traveling magicians or circuses. A number of permanent structures housing camera obscuras were also constructed. Notable camera obscuras were found in Central Park in New York, in Philadelphia and in Santa Monica, California. A well-known camera obscura still exists in Ocean Beach in San Francisco.

When contemporary people are introduced to a camera obscura, they probably recognize the first portion of the term. The camera obscura is the precursor of the modern day camera and has a long history of image capture. Leonardo Da Vinci is considered to be the first to use the camera obscura for image capture. At the beginning of the 16th century, Da Vinci and his compatriots would trace the images formed by the camera obscura in order to provide the framework for drawings. The artists would then use their skills to complete the drawings they began with the camera obscura. Jan Vermeer from Holland was an artist of the 17th century who was believed to use a camera obscura in his renowned artwork.

During the 16th and 17th centuries, a number of scholars began to experiment with lenses and diaphragms. A diaphragm controlled the amount of light that entered the camera obscura. These scholars noticed that the image would become darker but sharper when the hole was made smaller. Conversely, the image became brighter and more blurred when the hole was made larger. In 1568, Daniele Barbaro first described a camera obscura using a lens. Lenses were used to focus objects that were observed in the camera obscura. A combination of lenses and diaphragms provided the ability to have more of the outside area in focus at one time. The use of lenses and diaphragms became important components of modern cameras. In 1588, Giovanni Battista della Porta published a book, Magiae Naturalis. In this book, he described the camera obscura and suggested that it would be a great tool for artists. The artists' use of the camera obscura reigned for nearly two and a half centuries until Joseph Nicephor Niépce of France produced the first photograph on a pewter plate in the summer of 1827. Improvements on the camera obscura image capture have continued since Niépce's first photograph. Even contemporary digital photographs owe their image capture to a small camera obscura surrounded by modern technology.

Camera obscuras have been important tools in science. Leonardo Da Vinci used a camera obscura to demonstrate his theories on the workings of the human eye. Camera obscuras explained aspects of the physics of light by demonstrating that light reflected off of objects and traveled in a straight line. For example, light reflected from the top of a tree traveled downward to reach the opening in a camera obscura. The light continued in its straight-line trek and appeared near the bottom of the opposite wall. Light reflected from the ground level of the tree traveled upward to reach the opening in the camera obscura and continued to travel upward and appeared near

the top of the opposite wall. Therefore, the inverted image appeared in the camera obscura because light traveled in a straight line.

The camera obscura was found to be particularly useful in the field of astronomy. In the 13th century, Roger Bacon used a camera obscura to observe a solar eclipse. His use of the camera obscura resulted in other people following his example. The French astronomer Guillaume De Saint-Cloud commented about viewing a solar eclipse on June 5, 1285. He noted that if people viewed the eclipse for too long, they experience blindness for a time of several hours to several days. He suggested that using a camera obscura would be a safe method of viewing a solar eclipse. Johannes Kepler used a camera obscura to view solar eclipses and also the transit of Mercury in 1606. Some credit Kepler as the first to use the term, "camera obscura." Today, people still use camera obscuras to make safe observations of solar eclipses.

The planetarium obscura at the University of South Carolina Aiken was made possible by the vision of physics professor, Henry Gurr. Gurr was the building committee chairperson for the Ruth Patrick Science Education Center (RPSEC), which was completed in 1991. The RPSEC was to contain a planetarium and Dr. Gurr saw the opportunity to provide the facility with a unique feature, the planetarium obscura.

The planetarium contains a 30-ft dome tilted at a 30° angle. The chosen angle was steeper than the 15° recommended by the architect. The 30° angle was chosen in order to allow the camera obscura more dome surface to project the image. A large, round window was built into the back of the planetarium. The wall just inside of the window has a square hole measuring 48 X 48 inches that is fitted with a removable panel. This larger panel has a smaller removable panel that measures 12 X 18 inches. The smaller removable panel is fitted with an adjustable diaphragm that can control the amount of light passing through the hole. The hole of the camera obscura is easily obscured so that light coming through it does not interfere with planetarium shows.

A main challenge for a planetarium obscura is that the back of the theater is where some of the best projection and seating is located. The back wall of the Dupont Planetarium is an outside wall, which means that there is no projection both as is commonly found in other planetariums. Additionally, no seats are located along the back wall. Visitors enter near the rear of the planetarium and pass along the outside wall. When they arrive at opening for the camera obscura, the visitors make a 90° left turn to approach the seating area. The seats are located on either side of a set of stairs that lead downward and into the heart of the planetarium.

It was necessary to put some projectors in the rear of the planetarium in such a way as not to interfere with the camera obscura or with guests entering and exiting the planetarium. The first approach used to address this situation was to place projectors on a movable rack. The rack was moved out of the way when guests entered the theater and when the camera obscura was being used. Before each planetarium show, the rack had to be rolled into place and then moved out of the way when the show was completed. This system proved to be quite a nuisance so an alternative was sought.

The selected solution was to construct some permanent shelving that was oriented in such a way as not to interfere with the light path of the planetarium obscura or the flow of patron traffic. Measurements were taken to determine the path of the light that entered the hole at the back of the planetarium. In order to avoid interference with patron traffic, permanent shelving was suspended from the ceiling. The placement of the shelving was critical to allow the projectors to be as close to the dome as possible without invading the space where light traveled from the hole in the back of the planetarium. The shelving was finally installed in the fall of 2000 and has been a great success.

The planetarium obscura at USC Aiken has offered a unique experience to many visitors. The planetarium obscura displays an image of the entryway to the RPSEC, including the two sundials that highlight the plaza area. During the late fall and early winter there occurs another, unexpected feature. Because the sun is lower in the sky during that time of the year, the sunrays pass directly through the hole and into the planetarium dome. The bright image of the sun moves along the dome and provides an interesting, inverted sunset on clear evenings. The Dupont Planetarium is a successful combination of a complex, modern planetarium projection system and a simple, historical projection system.

References

Bogre, M. (1988). Pinhole Revival. Popular Photography, 95(2), 46-54.

Joseph, C. (1994, January). Through the Pinhole. Amateur Photographer, pp. 20-21.

Martyn, R. (1992, August). A Hole in One. Practical Photography, pp. 58- 61.

Patti, T. (1994). Origin of the first camera lens for the camera obscura. Photographic Society of America Journal, 60(5), 11.

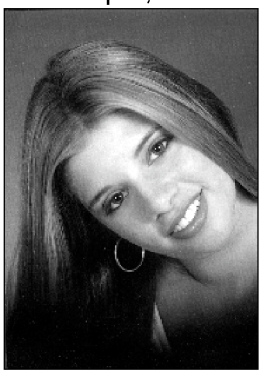
Roberts, J. A. (1995). Mapping the sun's path with a pinhole camera. Science Activities, 32(1), 24-28.

Wagner, R. Marvin, J., & Moeller, J. (1993). Three handy observing aids. Astronomy, 21(3), 60-61.

Young, M. (1989). The Pinhole Camera, Imaging without Lenses or Mirrors. The Physics Teacher, 27(9), 648-655.

Happy New Year (of the Ram)

Lauren Marks
Senior Intern
Craigmont Planetarium
Memphis, Tennessee



The U. S. Postal Service issued a new stamp for Chinese New Year

Bring out the fireworks! Light the lanterns! Follow the dancing dragon! We're celebrating Chinese New Year on February 1st. Chinese New Year is based on a lunar calendar. It occurs on the date of the second new Moon after the winter solstice. It comes as early as the latter part of January and as late as mid-February.

New Year's Day on the Gregorian calendar is the first day of 2003. On the Chinese calendar, however, the new year begins on the first day of the year 4701. This "Spring Festival" is a time of great joy for Chinese people. Festivities begin 22 days before the New Year date and continue for 15 days afterwards.

Food is special in all Chinese festivals. New Year's is no exception. It's time to buy and eat huge quantities of dried meats and fruits, special sausages, sweet and salty cakes, and numerous other delicacies.

The high point of the season is New Year's Eve. Every member of each family returns home on this day, if possible, to share a last special dinner with his/her family. Children receive red envelopes full of *lucky* money. The celebration is never complete without the thunderous roar of exploding firecrackers and whistling rockets. They're meant to frighten evil spirits and excite the gods. This display continues till after dawn on New Year's Day.

At daylight homes are busy. People light ceremonial candles, burn incense and paper money, and start a cacophony of firecrackers. Families paste spring poems, with lucky phrases in black or gold ink on red paper, on or around every door. After breakfast the family visits a local temple to pay respects to the gods. Next come visits with relatives and friends.

Musicians parade through the streets stopping at every door to announce spring's arrival. Days following New Year include more religious ceremonies. The eleventh day is a time to invite in-laws to dinner.

The Lantern Festival is fifteen days after New Year's on the date of the next full Moon. It marks the end of the New Year season.

This holiday evolved from Chinese beliefs that celestial spirits fly about in the light of the first full Moon of the New Year. To aid them in their search for spirits, people used torches and later lanterns of every conceivable size, color, and shape. One of the special features of this holiday is the dragon dance. It is an extremely colorful event involving hundred foot long dragons, lit with flashing eyes and bodies, pounding drums, cymbals, and brass instruments.

Celebrate New Year's twice—on both January 1 and February 1. Have a happy Chinese New Year!

Paul Campbell Fellowship Award Nomination Form

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

Nominee's name: _____

Qualifications: _____

_____

_____

_____

_____