Articles
6 IPS Committees: A Status Report .......................... Jim Manning
8 Minutes of the IPS Council Meeting ...................... Lee Ann Hennig
11 Results of the 1996 Members' Questionnaire .......... Keith Johnson
13 Financial Report .............................................. Keith Johnson
14 Outer Space Never Sounded Like This! ............... Roy Kaelin

Features
17 Computer Corner: WorldClock Lite .......................... Ken Wilson
23 Regional Roundup ........................................ Lars Broman
27 Book Reviews .................................................. April S. Whitt
32 President's Message ......................................... Jim Manning
36 What's New ................................................... Jim Manning
39 Forum: Entering the Profession .......................... Steve Tidey
42 Planetarium Memories: Circus Popcorn Sawdust .... Kenneth E. Perkins
44 Gibbous Gazette ............................................. Christine Shupla
47 Planetechnica: Shaft-Couplings ....................... Richard McColman
52 Mobile News Network ...................................... Sue Reynolds
58 Jane's Corner .............................................. Jane Hastings
"The ZKP3 is fantastic... It projects the moon phases with a realism I never knew possible in a planetarium. Its smaller size opens up the sky much better for many students. I don’t have to worry about pointing out Sirius, and having half the class unable to see what I’m pointing to."

-Jim Beaber, Director
Robert H. Johnson Planetarium
Lakewood, Colorado

Installed in Jefferson County School District’s Robert H. Johnson Planetarium in 1995, the ZKP3 Skymaster projector from Zeiss has exceeded Jim Beaber’s expectations. Designed to fit new or existing dome sizes of 16 to 36 feet, the ZKP3 is small in dimensions, but versatile in performance. It’s starfield will project over 7000 stars and can be custom designed to customer specifications. Control desk and computer automation are part of the basic system.

The ZKP3-

For more information about the Skymaster ZKP3, the Starmaster ZMP, or Universarium MVIII call Pearl Reilly at 1-800-726-8805.

Zeiss. Seeing is Believing.
# INDEX OF ADVERTISERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCC-Systems Corp.</td>
<td>15</td>
</tr>
<tr>
<td>Bowen Productions</td>
<td>55</td>
</tr>
<tr>
<td>Commercial Electronics Ltd.</td>
<td>16</td>
</tr>
<tr>
<td>Davis Planetarium</td>
<td>19</td>
</tr>
<tr>
<td>East Coast Control Systems</td>
<td>22</td>
</tr>
<tr>
<td>Evans &amp; Sutherland</td>
<td></td>
</tr>
<tr>
<td>Goto Optical Manufacturing Co.</td>
<td>26</td>
</tr>
<tr>
<td>Joe Hopkins Engineering</td>
<td>31</td>
</tr>
<tr>
<td>Laser Images, Inc.</td>
<td>38</td>
</tr>
<tr>
<td>Miami Space Transit Planetarium</td>
<td>43</td>
</tr>
<tr>
<td>Minolta Corporation</td>
<td></td>
</tr>
<tr>
<td>NEOS Technologies</td>
<td>35 &amp; 41</td>
</tr>
<tr>
<td>Orlando Science Center</td>
<td>45</td>
</tr>
<tr>
<td>R. S. Automation</td>
<td>46</td>
</tr>
<tr>
<td>Seiler Instruments</td>
<td></td>
</tr>
<tr>
<td>Sky-Skan, Inc.</td>
<td>51</td>
</tr>
<tr>
<td>Spitz, Inc.</td>
<td>57</td>
</tr>
</tbody>
</table>

# Associate Editors

<table>
<thead>
<tr>
<th>Jon U. Bell</th>
<th>Kenneth Perkins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening the Dome</td>
<td>Planetarium Memories</td>
</tr>
<tr>
<td>Jeffrey H. Bowen</td>
<td>Sue Reynolds</td>
</tr>
<tr>
<td>Sound Advice</td>
<td>Mobile News Network</td>
</tr>
<tr>
<td>Lars Broman</td>
<td>Christine Shupla</td>
</tr>
<tr>
<td>Regional Roundup</td>
<td>Gibbous Gazette</td>
</tr>
<tr>
<td>Stu Chapman</td>
<td>Steve Tidey</td>
</tr>
<tr>
<td>Focus on Education</td>
<td>Forum</td>
</tr>
<tr>
<td>Jane G. Hastings</td>
<td>Ken Wilson</td>
</tr>
<tr>
<td>Jane's Corner</td>
<td>Computer Reviews</td>
</tr>
<tr>
<td>Richard McColman</td>
<td>April Whitt</td>
</tr>
<tr>
<td>Planetecnica</td>
<td>Book Reviews</td>
</tr>
<tr>
<td>Jim Manning</td>
<td>What's New</td>
</tr>
</tbody>
</table>

# Final Deadlines

- March: January 21
- June: April 21
- September: July 21
- December: October 21

http://home.earthlink.net/~jmosley/Planetarian
I. P. S. Officers

President
Jim Manning
Taylor Planetarium
Museum of the Rockies
Bozeman Montana 59717 USA
(1) 406-994-6874
(1) 406-994-2682 fax
amwmj@gemini.osca.montana.edu

President Elect
Thomas W. Kraupe
Forum Der Technik Planetarium
Museumsalz 1
D-80538 Muenchen
Germany
(49) 89-21-125-250
(49) 89-21-125-255 fax
tkraupe@eso.org
100626.1077@compuseve.com
http://www.fdt.de/

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

Executive Secretary
Lee Ann Hennig, Planetarium
Thomas Jefferson High School
6560 Braddock Road
Alexandria, Virginia 22312 USA
(1) 703-750-8380
(1) 703-750-5010 fax
lahennig@pen.k12.va.us

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

1998 Conference Chairman
July 13-16, 1998
Dr. Tadao Nakano, Director
The Science Museum of Osaka
Nakanoshima, Kita-Ku
Osaka 530, Japan

1998 Conference Chair
Undine Concord
Planetarium Administrator
London Planetarium
Marylebone Road
London NW1 5LR England
(44) 071-466-1121
(44) 071-465-0862 fax

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

Publications Chair
Undine Concord
Planetarium Administrator
London Planetarium
Marylebone Road
London NW1 5LR, England
(44) 171-487-0227
(44) 171-465-0862 fax

I. P. S. Affiliate Representatives

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

Assoc. of Mexican Planetariums
Igancio Castro Pinal
Museo Tecnologico C.F.E.
Apartado Postal 18318 CP 11870 Mexico City, D.F.
Mexico
(52) 5-16-13-57
(52) 5-16-55-20 fax

British Assoc. of Planetariums
Undine Concord
London Planetarium
Marybone Road
London NW1 5LR, England
(44) 071-487-0227
(44) 071-465-0862 fax

Council of German Planetariums
Dr. Erich Uebelacker
Planetarium Hamburg
Hindenburgstrasse Oe1
D-22303 Hamburg, Germany
(49) 40-514985-0
(49) 40-514985-10 fax

European/Mediterranean Planetarium Association
Dennis Simopoulos
Eugenides Planetarium
Syngrou Avenue—Amfitheia
Athens, Greece
(30) 1-941-1181
(30) 1-941-7972 fax
dps@eugenides_found.edu.gz

Great Lakes Planetarium Assoc.
Susan Reynolds
Onondaga-Cortland-Madison B.O.C.E.S.
50 Fourth Street
Syracuse, New York 13221-1675
(1) 315-362-2671
(1) 315-362-1539 fax
sreyolds@ocvm.cnycrug.org

Great Plains Planetarium Assoc.
April Whitten, Business Mgr.
Mallory Ronziue Planetarium
6th & Dodge Streets
Omaha, Nebraska 68128 USA
(1) 402-554-2511
(1) 402-554-3100
awhitten@cws.usomaha.edu

Italian Planetarium’s Friends Association
Loris Rampone
National Archive of Planetaria
c/o Centro Studi e Ricerche Serafino Zani
via Bosca 24, CP 104
29066 Lumezzane (Brescia), Italy
(30) 671861
(30) 872545 fax

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

Middle Atlantic Planetarium Society
Fred Stutz
306 Beechgrove Court
Millertville, Maryland 21108 USA

Nordic Planetarium Association
Lars Broman
Broman Planetarium
Ostra Hamngatan 1
S-791 71 Falun
Sweden
(44) 3120 177
(44) 3120 137 fax
lars.broman@plriaturn.se
http://www.srm.se/on/oc-vpa.html

Pacific Planetarium Association
Jon Elwert
Lane ESD Planetarium
2300 Leo Harris Drive
Eugene, Oregon 97401 USA
(1) 451-461-8227
(1) 451-687-6460 fax
planetarium@edlane.lane.edu
http://www.cfn.org/~esd/plit/

Photography

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

Rocky Mountain Planetarium Association
John R. Peterson, RMPA President
El Paso ISD Planetarium
6531 Boeing Dr.
El Paso, Texas 79925 USA
johnp@tenet.edu

Russian Planetariums Association
Zinida P. Sitkova
Nizhnii Novgorod Planetarium
Pokhyalinsky SYezd 5-A Nizhnii Novgorod, 603 001 Russia
(7) 8312-34-21-51
(7) 8312-36-20-61 fax
sitkova@plan.sct-rn.gov.ru

Southwestern Association of Planetariums
Donna Pierce
Highland Park Ind. School District
4220 Emerson
Dallas, Texas 75205 USA
(1) 214-522-1856 planetarium
(1) 214-522-4515 fax
depierce@tenet.edu

Ukrainian Planetarium Association
Dr. Alexander P. Lenin
Republical Planetarium
57/3 Krasnoarmeiskaia Street
Kiev 252005 Ukraine
(1) 804-266-7966 fax
jh hare@aol.com

Please notify the Editor of changes of IPS officers and affiliate representatives.

Produced at the Griffith Observatory, Los Angeles, California
http://www.home.earthlink.net/~jmosley/planetary/html
Letters

Ideas Wanted

If you had a brand new planetarium in an area that has never had one, what would you do?

Victor Valley College, in Victorville, California, is building a Zeiss ZKP3 planetarium as part of a large new science building. The equipment should be installed in April with training sessions in May and project completion in July-August 1996.

The college is committed to making this a true "space/science theater" for all levels of our community, which has a population of 250,000. The college Foundation is working to provide additional financial support, and the planetarium will be a priority target of a major fund raising campaign that will start in February 1996. Therefore, it appears that money for program and support material purchases will be available.

What we need to do, then, is make the appropriate purchases. Obviously, lots of programs are available, and I have loads of ideas. But what would YOU do?

If you were in my position and if you wanted to have a successful, high-publicity "Grand Opening" presentation for the general public, then what would it be? Given your experience as a planetarian, what one or two or three programs would you start with? I am interested in either general topics and/or specific commercial offerings.

I appreciate your experience, and thank you for your help.

T. Scott Bryan
Director, Victor Valley College Planetarium 18422 Bear Valley Road Victorville, CA 92392 USA phone (619) 245-4271 ext. 324 fax (619) 245-9745 TSbryan@aol.com

Eclipse and Eclipse Programme

The solar eclipse of October 24, 1995, the path of which covered some densely populated regions of northern India, generated a great deal of enthusiasm and interest in the student community as well as in the common masses. Huge queues could be seen before the M. P. Birla Planetarium at Calcutta of the seekers of the Safe Solar Eclipse Goggles manufactured by a Pune (India) based firm "Thirdwave." The day of the eclipse drew nearer, their interest turned to near hysteria. I had to call the police to control the crowds when our stock of 35,000 gogles was exhausted in just five days. More than 200,000 people thronged at Diamond Harbour, near Calcutta, to watch the grand spectacle.

The enthusiasm shown by the public this time was in sharp contrast to the scene that we had in India only 15 years back. We had a solar eclipse on the 16th of February, 1980. The deserted state of the roads at the time—a curfew-like situation—became a phenomenon far exceeding in magnitude the eclipse itself. Credit for changing the attitude goes to planetaria (now 26 in India), science organizations, science clubs, and also in a major part to the two government-controlled Doordarshan (Indian Television Network). Last time the TV advised the people not to watch the event and to stay indoors, whereas this time it not only screened a number of curtain-raiser programmes covering the various aspects of the eclipse (including safety measures), but also made elaborate arrangements to televise the event on the National Network.

To match this enthusiasm we at the M. P. Birla Planetarium organized a National Seminar on the total solar eclipse on July 3, 1995, and we also screened special planetarium programmes. I devised two computer programs, one for solar eclipse simulations and the other for generation of a Flip-Book to meet the demands of students. Anyone interested in these programmes can write directly to me.

Piyush Pandey, Assistant Director
M. P. Birla Planetarium
96 Jawaharlal Nehru Road
Calcutta 700 071
India

FIRST ANNUAL ROCKWELL WRITING CONTEST

The Griffith Observatory, in the interest of stimulating the flow of information between scientists, science writers, and the public, proudly announces the sponsorship by Rockwell of a new annual offering of awards for the best articles in astronomy, astrophysics, and space science.

The stipulations are as follows:

- Awards will be made on February 1, 1997, for the articles which best communicate to the average reader, material of current or historical interest in astronomy, astrophysics, and space science.
- Articles must be a minimum of 10 pages and a maximum of 15 pages in length, typewritten, in English, double-spaced, and accompanied by a brief biographical sketch of the author. At least two finished, camera-ready ink diagrams, graphs, or photographs, ready for publication, must be included. The author's name and title of the article should appear only on a cover sheet and not on the pages of the article itself.
- The cash amounts of the awards are
  - $750.00 First Prize
  - $350.00 Second Prize
  - $250.00 Third Prize
  - $200.00 Fourth Prize
  - $75.00 Honorable Mention
- All articles must be postmarked by December 1, 1996. The contest is open to all interested persons (Griffith Observatory and Rockwell employees excepted).
- All winning articles become property of the Griffith Observatory. The winning articles will be published in the Griffith Observer.
- Previously published articles will not be accepted.
- Any number of articles may be submitted to the contest by one person, but only one prize will be awarded to a winning author.
- Judging will be done at the Griffith Observatory, and the decision of the judges is final. Each entry is judged anonymously so that the author's identity is unknown to all of the judges.
- Address all articles to: Awards Committee, c/o Griffith Observatory, 2800 East Observatory Road, Los Angeles, California 90027; (213) 654-1181
- Awards are made on the basis of clear and interesting style, accuracy, reader interest in the subject, correct grammar and syntax, originality in presentation and content, and neatness. Failure to meet the requirements on length, appearance, and illustrations may disqualify an entry from consideration.
IPS Committees:
A Status Report

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

Much of the work of our Society is accomplished through the very significant efforts of volunteers serving on committees, toiling on various projects and initiatives for the benefit of the membership. At the Council meeting in San Diego last October, we reviewed the status of all committees listed in either the By-Laws or Standing Rules, to bring ourselves up to date on which were currently active, which weren’t, and which should be. This review has continued since, and has included the assembling of current committee rosters.

The situations and circumstances of our assorted committees remain fluid and changing, of course, but this is their status as of late April...

1) Standing Committees
These are the committees either listed in the By-laws, listed in the Standing Rules as Standing Committees, or both.

Membership Committee
Function: To solicit members, admit candidates to membership, compile a current membership list, collect membership fees, provide a mailing list for any and all notices and publications of the Society, and oversee the IPS Packets for New Planetariums effort. (These functions have been carried out by the IPS Treasurer for some time.)

Subcommittee: IPS Packets for New Planetariums. This committee prepares packets of appropriate materials (including local affiliate contacts, the IPS brochure, resource addresses) and sends them to new planetarium personnel. (Administered by Donna Pierce.)

Members: Keith Johnson (IPS Treasurer), Reno, Nevada USA, Chair
Donna Pierce, Dallas, Texas, USA, IPS Packets Chair

Elections Committee
Function: To solicit and determine nominations and to conduct elections of IPS officers, and any ballots submitted to the general membership for vote, in accordance with the procedures provided in the By-laws and Standing Rules. (The committee will be preparing a slate of candidates for the year-end election which will be announced at the business meeting in Osaka; the ballot will include several By-laws amendments as well.)

Members: Steve Mitchell, Wheeling, West Virginia USA, Chair
Tatsuyuki Arai, Tokyo, Japan
David Batch, East Lansing, Michigan USA
Jon Bell, Fort Pierce, Florida USA
Anthony Fairall, Capetown, South Africa
Johan Gysenbergs, Genk, Belgium
Gabriel Munoz, Morelia, Michoacan, Mexico
Martin Ratcliffe, Pittsburgh, Pennsylvania USA
Joyce Towne, Philadelphia, Pennsylvania USA
Wayne Wyrick, Oklahoma City, Oklahoma USA

Awards Committee
Function: To administer the awards programs of the Society in accord with the guidelines in the By-laws and Standing Rules; to recommend candidates for the IPS Service Award, to accept nominations and determine eligibility for IPS Fellow awards, to prepare award plaques and certificates and to make award presentations at the biennial conference. (The committee is currently preparing for Service and Fellow awards to be made in Osaka.)

Members: Phyllis Pitluga, Chicago, Illinois USA, Chair
Tatsuyuki Arai, Tokyo, Japan
Ole Knudson, Aarhus, Denmark

Publications Committee
Function: To administer and oversee the publishing activities of the Society, including the Society’s journal, the planetarium directory, special publications as may be issued from time to time, IPS brochures, and other publications and efforts. (Ongoing publications include the Planetarian, John Mosley, executive editor, and the biennial planetarium directory; the most recent special publication was So You Want to Build a Planetarium. Current projects include the development of an IPS Home Page, preparation of a resource book, and reissuance of the Special Effects Handbook.)

Subcommittee: IPS Home Page Committee. This committee is developing an IPS Home Page on the World Wide Web on the Internet, to provide information on the Society and its activities, with links to related Web sites. (Members include Chair Tom Hocking, Alan Gould, Thomas Kraupe.)

Members: Undine Concannon, London, England, Chair
Alan Gould, Berkeley, California USA
Tom Hocking, Chapel Hill, North Carolina USA, Home Page Chair
Shoichi Itoh, Tokyo, Japan
Thomas Kraupe, Munich, Germany
Loris Ramponi, Brescia, Italy
Dale Smith, Bowling Green, Ohio USA
Gregg Williams, Merrillville, Indiana USA
Ken Wilson, Richmond, Virginia USA

Program Committee
Function: To plan and execute all arrangements for general (that is biennial) meetings subject to ratification by Council. (Traditionally, this committee is chaired by the biennial conference chair, and members include IPS officers.)

Members: Tadao Nakano, Osaka, Japan, Chair

Ethics Committee
Function: To arbitrate on questions of dispute between members and between members and their governing bodies. (The chair is vacant and the committee is presently inactive.)

Finance Committee
Function: To help determine expenditures and the annual budget, to propose a dues structure, to consider committee budgets, and to create appropriate contracts for any non-monetary compensation as required. (Traditionally, this committee is made up of the IPS officers.)

Members: Keith Johnson, Reno, Nevada USA, Treasurer
Jim Manning, Reno, Nevada USA, Treasurer
Jim Manning, Bozeman, Montana USA, President
Thomas Kraupe, Munich, Germany, President-Elect
Lee Ann Hennig, Alexandria, Virginia USA, Secretary
2) Ad Hoc Committees

These are committees listed as ad hoc committees in the Standing Rules which are currently or recently active or to be reactivated, or which are newly-formed committees.

Public Program/Script Contest Committee
Function: To administer the Eugenides Script Contest as provided in the Standing Rules. (This committee and the contest have been inactive in recent years, but the committee will be reactivated with the resumption of the contest next year.)

Consumer Affairs/Astrology Committee
Functions: To examine issues relating to consumer involvement with astronomy and/or the planetarium field, including areas that may cause the public to be misinformed. (Past projects include the development of reports on astrology, star-naming and similar programs. The committee currently has no ongoing projects; one possibility is examining astronomy-related consumer products such as toys.)

Members: Jeanne Bishop, Westlake, Ohio USA, Chair

Armand Spitz Fund Committee
Function: To maintain a fund and use it to further the ideas espoused by Armand Spitz. (The duties of this committee are currently administered by the Finance Committee.)

Language Committee
Function: To explore the possibilities of translation at conferences and publishing relevant articles in languages in addition to English, and to consider other language-related issues. (In the past, this committee has been instrumental in getting the IPS brochure translated into a number of languages. The committee is currently inactive and the chair vacant, but the committee will be reactivated shortly.)

History Committee
Function: To compile and maintain information and materials relating to the history of the Society, and to collect and maintain a photo history collection of IPS events and activities. (Historian John Hare makes periodic presentations of the photo archive at conferences.)

Members: John Hare, Bradenton, Florida USA, Chair; David Menke, Davie, Florida USA; Loris Ramponi, Brescia, Italy; Dennis Simopoulos, Athens, Greece; Norm Sperling, Oakland, California USA

Portable Planetarium Committee
Function: To help those interested in the use of portable planetariums and to provide a support system to assist portable planetarium users. (The committee maintains resources including a data base of users and specialists, curriculum and lesson materials, current mobile planetarium manufacturers, and low-cost special effects. The committee last year co-sponsored the first European Meeting of Itinerant and Low-Cost Special Effects. The committee is currently cataloging its resource materials, preparing a proposal for a publication of educational materials suitable for use in portable planetariums, and seeking contact people in each regional affiliate.)

Members: Steve Fentress, Rochester, New York USA, Chair; Jack E. Broman, Göteborg-Angered, Sweden (NPA); Dayle Brown, South Bend, Indiana USA (GLPA); Michel Dumas, Le Motte Chalancon, France (AFSP)

Planetary Development Group
Function: To draw up recommendations from IPS members on the subject of building a new planetarium or renovating an old one, with the guidelines intended for architects, museum directors, college and school system administrators, and others without much planetarium experience. (The committee produced the booklet So You Want to Build A Planetarium which offers a brief overview and a list of questions to consider in embarking on a new planetarium enterprise. The committee expects to rouse itself again soon to prepare a longer, more detailed guidebook and to publicize the shorter booklet to its intended audience.)

Members: Ken Wilson, Richmond, Virginia USA, Chair; Elmer Bataitis, Rochester, New York USA; Gary Lach, Jackson, Mississippi USA; Mike Murray, Bozeman, Montana USA; Sharon Parker, Davie, Florida, USA

Job Information Service Committee
Function: To maintain a list of job openings and to distribute this information as requested to members.

Members: Steve Fentress, Rochester, New York USA, Chair

Technology Committee
Function: To monitor and investigate existing and emerging technologies that have or may have an impact on planetariums, and to communicate on these matters to the IPS membership. (This is a new committee which has yet to be chaired and to begin work.)

3) Inactive Committees

The following ad hoc committees are listed in the Standing Rules, but are presently inactive and have been for some time due to lack of interest or viable projects.

Public Relations. (Function: to develop methods for publicizing and advancing the purposes of the Society.)

Outreach Committee
Function: To develop and foster contact and communication between IPS and other professional and educational organizations. (This committee is currently inactive).

Members: Martin Ratcliffe, Pittsburgh, Pennsylvania, Chair; Bill Gutsch, Kinnelon, New Jersey, IAU Representative; Dale Smith, Bowling Green, Ohio USA, ASP Representative

Planetariums and Science Crisis Committee
Function: To draft a document on this topic.

Committee for the Exchange of Communication and Personnel
Function: To help foster communication between planetarium personnel and to help planetariums interested in "twinning" (that is, establishing a relationship of mutual support).

Script Bank Committee
Function: To gather and maintain a collection of planetarium scripts to be made available to IPS members in accord with developed guidelines.)

(Please see Committees on page 10)
Minutes of the
IPS Council Meeting
San Diego, California
October 13, 1995

* indicates action items

In attendance:
President Jim Manning
President Elect Thomas W. Kraupe
Past President Bill Gutsch
Treasurer Keith Johnson
Secretary Lee Ann Hennig

Affiliate Representatives:
Association of Mexican Planetariums (AMPAC)-Ignacio Castro
Council of German Planetariums (RDP)-Thomas Kraupe for Dr. Erich Uebelacher
European/Mediterranean Planetarium Association (EMPA)-Dionysios Simopoulos
Great Lakes Planetarium Association (GLPA)-Dayle L. Brown
Japan Planetarium Society- Dr. Tadao Nakano
Middle Atlantic Planetarium Society (MAPS)-Lee Ann Hennig for Fred Stutz
Nordic Planetarium Association (NPA)-Lars Broman
Pacific Planetarium Association (PPA)-Jon Elvert
Rocky Mountain Planetarium Association (RMPA)-Sheri Trivich for Bess Amaral
Russian Planetarium Association (RPA)-Zinaida P. Sitkova
Southeastern Planetarium Association (SEPA)-John Hare
Southwestern Association of Planetariums (SWAP)-Donna C. Pierce

Also present:
Singo Kawakami- '96 Conference- Osaka, Japan
Jacob Aris- San Diego State student- Russian Translator
Gabriel R. Junco- IFDC

Affiliates not in attendance:
Association of French-speaking Planetariums
British Association of Planetariums
Great Plains Planetarium Association
Italian Planetaria's Friends Association
Nordic Planetarium Association
Ukrainian Planetariums Association

The meeting was called to order at 9:00 a.m. by President Jim Manning. The Secretary’s Report had been previously published in the June 1995 Planetarian. The report was reviewed and approved.

The Treasurer’s Report was presented, reviewed and approved. Keith reported on the effectiveness of a new credit card system purchased for the organization. It reduces the minimum monthly fee for Mastercard and Visa, and will allow us to accept additional cards. The system will also enable the Treasurer to keep better records and make transactions electronically. Discussion followed on travel support for Council members to the off-year meeting. President Jim Manning spoke of the efforts of Dennis Simopoulos in trying to find European support for Russian and Ukrainian representatives to travel to the Council Meeting. Unfortunately nothing could be firmed up on short notice. However, Thomas Kraupe was able to work with Zeiss in providing financial support enabling Zina Sitkova to attend the San Diego meeting. The Council is grateful to the Zeiss Company for their generosity in support of the IPS Representatives. Because of communication and time constraints, it was not possible to arrange for Alexander Lein’s trip. *President Jim Manning will appoint Past President Bill Gutsch to chair a committee to look into sources for funding grants for travel to IPS events. The Affiliates and/or institutions are encouraged to help support their representatives as much as possible as the Standing Rules so stipulate.

Written reports from the Affiliates were reviewed. At the Oklahoma City Council Meeting, 1993, Council voted to dispense with the written reports and allow the “Regional Round-Up” in the Planetarian to serve in its place. However, Council felt that there was certain information that should be included in an Affiliate Report. The motion was made and seconded to reestablish these written reports. Discussion followed on the format and content of the reports. The motion passed unanimously. *The President charged the Secretary to establish a form based on input from the Council and Affiliates. Reports will be sent to the Secretary by a set date and then distributed to the Council.

Zina Sitkova of the Russian Planetarium Association thanked everyone for making it possible for her to attend the Council Meeting. The planetariums of the former Soviet Union are still in a state of change and are having difficult times. They remain in need of materials, slides, star and auxiliary projectors, lamps, etc. Zina reports that letters of support from officials outside Russia are very helpful in justifying the existence and importance of planetariums. Zina told of the task of trying to keep the planetariums operating under dire circumstances.

Dennis Simopoulos of the EMPA discussed the upcoming European Association of Astronomy Education to be held in Athens on November 22-26, 1995. He pointed out the need for a European Planetarium organization. The attendees at the November Astronomy Conference will address the idea of a pan-European association.

Dayle Brown reported on GLPA’s efforts to provide twenty-five sets of slides to planetariums in Russia and the Ukraine.

Ignacio Castro of AMPAC, reported on preliminary work being carried out to establish an organization uniting the Spanish speaking planetarians.

Jon Elvert of PPA, reported on the status of their project to sponsor three planetariums, one each in the Ukraine, China, and Australia, by providing them with $100.00 worth of slides, scripts, and other materials.

A discussion of the needs of struggling planetariums was initiated by Dennis Simopoulos. The general consensus was that although standards and projectors are critical to planetarium operation, we should not overlook the importance of sharing production techniques and ideas.

The Election Committee Report was read on behalf of Chair Tom Stee. Tom regretfully resigns, and a new Chair will be appointed by the President. Council discussed procedures relating to elections and nominations. *President Jim Manning suggested that Council review the standing rules governing elections and propose amendments to be discussed in Osaka. The nature of the amendments would be the creation of an oversight committee, the inclusion of a certified public accounting validation of elections, and the reporting of actual numbers of voting membership to Council—the changes would go into effect at the next election. The motion was made by Dennis Simopoulos, seconded by Lars Broman and passed unanimously.

The Membership Committee Chair Keith Johnson clarified questions regarding special classes of membership. Affiliates are encouraged to send timely updates to Keith concerning changes of personnel or planetarium status. Affiliates and/or institutions may want to consider sponsoring a planetarium for IPS membership if those planetariums are financially unable to do so on their own. Donna Pierce will continue to provide
The Awards Committee Report was read on behalf of Chair Phyllis Pitluga. The Council considered nominees for the IPS Service Award. *A nominee was voted upon and accepted and will be announced at the Osaka Conference. *It was requested that a list of IPS Fellows be published.

The Publications Committee Report was read on behalf of Chair Undine Concannon. Congratulations to Keith on getting the new IPS Directory out to members. *Please send corrections/additions/deletions to Keith. Affiliates are encouraged to check entries for their regions and report changes. *Thomas Kraupe requested that in the future Keith send Affiliates a copy of the IPS data base so addresses, e-mail and fax/phone information can be checked. *An addendum to the Directory will be published at the end of the Summer 1996. John Mosley continues to edit an excellent Planetarian. Lars asked if perhaps the Planetarian would be less expensive to mail internationally if we went to a lighter weight paper. *President Jim Manning will consult with the Editor and the Publications Committee for more information. Chair Undine Concannon recommends GLPA’s Source Book as an alternative to producing an IPS Resource Guidebook. The GLPA Source Book is available to non-members for $8.00. *A suggestion was made that perhaps IPS could supplement the publication with additional resources and international references and request a reprint from GLPA.

Discussion of the Special Effects Handbook centered on the value and purpose of reprinting/updating this publication. *The consensus was to make copies of the present Handbook available at cost and to produce an addendum of new contributions including tips from GLPA’s publication. This information could be a part of the IPS Home Page.

The Portable Planetarium Publication consists of materials provided at cost to requesters. Chair Sue Reynolds will continue to review and catalogue requests for such a publication. The Publications Committee will consider a formal proposal for such a publication when more details are provided.

There is a need for IPS *Membership Brochures in other languages. We already have brochures available in several languages and it was agreed that we should provide translations on an as needed basis. *President Jim Manning will revitalize the Language Committee (consisting of international membership) to work in concert with the Publications Committee to accomplish this job. The brochures should also include the nearest local Affiliate address, with an insert containing information on up-coming conferences. Dennis suggested that selected Planetarian articles be translated into several languages and made available to the membership. The Publications Committee will also be consulted on the feasibility of setting up a Home Page on the World Wide Web. *A motion to have the Page on line by January 1, 1996, was made by Lars Broman, seconded by Donna Pierce and unanimously approved. Details and formal proposals on new initiatives will be considered via the President’s Newsletter and at the 96 Osaka Conference.

The Finance Committee reported that the finances of the organization are in good order.

The Program Committee report was presented by Dr. Tadao Nakano and Mr. Singo Kawakami concerning the 1996 Osaka Conference. The Conference will run from July 13 through July 16 with pre and post-conference tour options. The Council Meeting is currently scheduled for July 10. Discussion centered on travel, facilities and budget concerns. Conference attendees are urged to work with the Kinki-Nippon Travel Agent to secure the best rates for airfare. A video on the Conference is available to Affiliates to share at their conferences-contact Bill Gutsch. *Council recommends that future Conference Hosts make a short video or slide presentation that can be circulated among Affiliates.

President Jim Manning reviewed Undine Concannon’s Report for the 98 Conference in London. An early summer date is proposed. Plans for the Conference are progressing nicely.

Considerable discussion followed concerning the time of year our conferences are held. The question was raised as to why they are always in the summer. Other discussion focused on standards for paper presentations and conference proposals in general. *The President proposed that perhaps we need a Conference Review Committee from the Council to more closely review and monitor the incoming proposals. *Dennis Simopoulos proposed including a survey in the Membership Dues Renewal addressing member views on preferred dates for IPS Conferences - Council agreed.

All Committee Reports were accepted.

Invitations for IPS 2000 were extended through five presentations.

1. Gabriel Munoz invited IPS to conference in sunny Morelia, Mexico, hosted by Morelia’s Planetarium.
2. Robert Berdan and Brad Struble invited IPS to meet near the Canadian Rockies in Calgary, hosted by the Alberta Science Center.
3. Amy Singler presented Chicago’s Adler Planetarium invitation to meet in the Windy City in 2000.

4. Sue Griswold offered the Kelly Planetarium, Discovery Place in Charlotte, North Carolina as an enthusiastic host.

5. Since the representative was unable to attend, a written invitation from Pierre Lacombe of the Planetarium of Montreal was distributed for review and comment.

The Council was most appreciative of the time, enthusiasm, and work that went into these presentations. *The March Issue of the Planetarian will include information on all bids for the IPS 2000 Conference.

Lars Broman will issue a formal invitation to President Elect Thomas Kraupe, to hold the off-year 1997 IPS Council Meeting in conjunction with the NPA Conference, August 22-24, 1997. Council voiced its appreciation for the gracious offer and a decision will be made at the Osaka Conference.

The History Committee Report was presented by Chair John Hare. Council approved expenditures for a file cabinet to house the archives.

The Planetarium Development Group Report was given on behalf of Chair Ken Wilson. *So You Want to Build a Planetarium* publication is still available through Keith. Ken needs members to serve on his committee as writers for a more comprehensive Guidelines Book.

The Portable Planetarium Committee Report was covered during the Publications Committee Report.

The Consumer Affairs/Astrology Committee Report was read on behalf of Chair Jeanne Bishop’s behalf. The Committee is still seeking to provide assistance in the battle against astrology and in educating consumers on the true story of the International Star Registry. Jeanne could certainly use committee members in dealing with this important aspect of our profession.

The Job Information Service Committee Report was presented on Chair Steve Fentress’ behalf. He reported that sixteen job openings have been reported since the last report in Cocoa.

A general review and evaluation of other Ad Hoc Committees resulted in the following actions:

*The Armand Spitz Fund is instrumental in supporting the Universe in the Classroom publication (to be included as an insert in the December Issue of the Planetarian). This Fund will now fall under the auspices of the Finance Committee.

*The Script Contest Committee will be reestablished under revised rules to function more effectively. Dennis Simopoulos reported on the willingness of the Eugenides Foundation to continue to sponsor a script contest, however, the guidelines must be clearly stated and followed.
The Language Committee will be revived.

The following committees will be discontinued: Public Relations, Communication, Improvement of Science Education, Curriculum Projects, Script Bank. These committees were deemed either inactive, obsolete, or their functions duplicated by other committees.

The President proposed the addition of two new Ad Hoc Committees. *The Outreach Committee will be chaired by Martin Ratcliffe. The purpose of the committee is to seek out and maintain contact with other organizations for our mutual benefit. Committee member Dave Smith will be the IPS Liaison to the Astronomical Society of the Pacific Committee of Sponsoring Organizations. The ASP Symposium in College Park, Maryland in June 1995, announced a number of ininitatives in Astronomy Education. The ASPCSO will be responsible for monitoring those initiatives.

The Techology Committee will serve as a clearing house for information on the current trends in technology as they relate to planetariums.

The Council then proceeded to discuss and review Standing Rules amendments and By-Laws amendments. Many of the changes were needed to update the rules and remove conflicting statements. A full listing of the changes and amendments will be printed in a separate document. The following actions were taken:

Standing Rules Amendments

**Article II.C.1:** add this statement: "This representative or his/her institution must be a current member of the Society."

**Article III.3.A.B.C.D.:** update all financial references to their current status.

**Article VI:** Replace the current Ad Hoc Committee section with a general statement: "Ad Hoc Committees shall be appointed as needed." The names and purposes of the committees will be attached as a separate list, not included in the Standing Rules.

**Article IX.B.1:** to read as follows:

1. Concerning conference financial procedure, hosts will:
   a. File a financial plan for the conference with the Treasurer two years prior to the conference, including a statement of how accounts will be set up to collect and disburse revenues.
   b. Include a preliminary conference budget as part of the conference planning status report presented at the Council Meeting two years prior to the conference, and a detailed budget at the Council Meeting one year prior based on anticipated revenues and expenditures.
   c. Submit to the Treasurer a final accounting report listing all income and expenditures, within six (6) months of the end of the conference.
   d. Organize and maintain all purchase orders, invoices, and receipts for one year following the conference, for examination upon request of the Finance Committee.
   e. These procedures will go into effect for the 2000 conference, and are optional and voluntary before then.

**Add Article IX.C.1:**

C. Council Meetings During Biennial Conferences

1. Since it is expected that Council Members will attend the Biennial Conference regardless, there is no provision for refund of transportation and lodging expenses, except in the following instance since the Council meeting customarily occurs the day prior to the start of the conference, it is expected that Council Members must arrive a day early; therefore, Council members may submit for 100% reimbursement of one night's lodging. Extent of reimbursement will depend on the funds available as determined by the Treasurer and the Finance Committee.

**Appendix B.I:** Replace "Winter Solstice" with "December"

**Appendix C.I.D.4:** change to "For accounting requirements, see Article IX.B.1."

By-Laws Amendments

*The Elections Committee will be charged with preparing the ballot for membership consideration on three proposed By-Law Amendments.

**Article III.1.B:** eliminate the Honorary Member category

**Article VIII.I:** add to the statement, "The term of office of the Committee shall begin with the meeting of the Council in odd-numbered years and continue until the next Council Meeting in an odd-numbered year, except where specified otherwise.

**Article VIII.4:** Reword the first statement to read, "The Publications Committee shall consist of the Chair and as many committee members as required provided that representation is international."

Under New Business, President Jim Manning will investigate producing high quality slide sets of some of the latest images from HST, Galileo, etc., with the thought of making them available for distribution. Jim will also look into the time and effort involved in developing a public service video on behalf of planetariums. Discussion continued on other possible projects related to multimedia. A letter of support was sent on behalf of IPS concerning the merits of a conference on Formative Evaluation. The President's letter stressed the importance of internationalizing the results.

* Council voted to lend our support as a sponsor to the efforts of Astronomy Day, as requested by Gary Tomlinson.

* Council discussed Jeff Bowen's suggestion of developing a video with selected images and special effects that can be utilized in planetariums. President Jim Manning will explore this suggestion further.

All business being completed, Dennis Simopoulos moved for adjournment, Donna Pierce seconded the motion, and it passed unanimously. The Council Meeting adjourned at 6:00 p.m.

Respectfully submitted,

Lee Ann A. Hennig
Secretary, IPS
October 13, 1995

---

**Curriculum Projects Committee.** (Function: To develop projects relating to education and curriculum matters)

**Conclusion**

Current and active IPS committees deserve our thanks and appreciation for the often thankless work that they do for our benefit and on our behalf. The next time you see the committee chairs and members listed above, please be sure to let them know that you appreciate their efforts.

And of course, there's always room for one more. If you have an interest in any of the committees and the work that they do, please contact the chairs or any of the committee members for more information, to learn how you might also serve, or to suggest useful projects and activities.

Remember that the International Planetarium Society is an all-volunteer group, whose success depends on everyone pitching in and offering their time, expertise, and plain old sweat in support of the goals and efforts of our organization. Won't you join us in the effort? We will all be the better for it!
Results of the 1996 Members' Questionnaire

Keith Johnson
Fleischmann Planetarium
University of Nevada
Reno, Nevada 89557 USA

Your humble officers included a questionnaire with the 1996 membership renewal forms in order to find out how members felt about some projects that the officers and the IPS Council have discussed in the past, and to obtain rough estimates of annual attendance. I sent out over 600 renewal forms, and 229 were returned by the end of March, but I'm sure I'll get the rest Real Soon Now.

Attendance

One area we wanted to get some information about was attendance at planetariums around the world. We asked for the number of shows presented in a year, and the total attendance.

Some responders did not have this information, and some responded with only one of the two numbers. And, of course, the numbers reported represent only a small fraction of the world's planetariums. Even if all IPS members had responded, it would have accounted for perhaps one quarter of the world's planetariums. So the estimates given below are to be taken with a few moles of sodium chloride.

Table 1 shows reported attendance figures as a function of dome size. I divided the range of sizes into bins, based on (a) the natural clustering of dome diameters around certain preferred values (9.1 m, for example, is a common diameter), and (b) my desire to include adequate numbers in each bin where possible. The first column shows these ranges.

The column "#" shows how many planetariums are in each bin, based in information currently in the IPS Directory database. The column "# rpt." shows how many planetariums sent in responses to the questionnaire.

"Av. Att." refers to the average annual attendance for domes within that bin that responded. To account for non-responding domes, I multiplied the average by the number in that range, and show that as "Total Att." This is only an estimate, of course.

Similarly, "Av. Shows" indicates how many shows per year were given by responding planetariums, and "Total Shows" indicates how many shows we calculate were given by all planetariums in that bin.

There are obvious problems arising from small numbers in some bins. For instance, only one planetarium sent in a response from the bin "17.6-19.5." Since it happened to be a very large-volume installation with 600,000 visitors reported last year, and since there are 39 known planetariums in that bin,

<table>
<thead>
<tr>
<th>Diam</th>
<th>#</th>
<th># rpt.</th>
<th>Av. Att.</th>
<th>Total Att.</th>
<th>Av. Shows</th>
<th>Total Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0-4.4</td>
<td>115</td>
<td>8</td>
<td>9430</td>
<td>1084450</td>
<td>309</td>
<td>35535</td>
</tr>
<tr>
<td>4.5-5.5</td>
<td>122</td>
<td>8</td>
<td>13030</td>
<td>1589660</td>
<td>351</td>
<td>42822</td>
</tr>
<tr>
<td>5.6-6.8</td>
<td>258</td>
<td>14</td>
<td>9090</td>
<td>2345220</td>
<td>425</td>
<td>109650</td>
</tr>
<tr>
<td>6.9-7.8</td>
<td>190</td>
<td>19</td>
<td>12260</td>
<td>2329400</td>
<td>449</td>
<td>85310</td>
</tr>
<tr>
<td>7.9-8.5</td>
<td>174</td>
<td>8</td>
<td>22490</td>
<td>3913260</td>
<td>548</td>
<td>95352</td>
</tr>
<tr>
<td>8.6-9.5</td>
<td>294</td>
<td>52</td>
<td>14870</td>
<td>4371780</td>
<td>538</td>
<td>158172</td>
</tr>
<tr>
<td>9.6-10.5</td>
<td>120</td>
<td>8</td>
<td>27300</td>
<td>3276000</td>
<td>537</td>
<td>64440</td>
</tr>
<tr>
<td>10.6-11.6</td>
<td>23</td>
<td>4</td>
<td>24000</td>
<td>552000</td>
<td>955</td>
<td>21965</td>
</tr>
<tr>
<td>11.7-12.4</td>
<td>132</td>
<td>23</td>
<td>35630</td>
<td>4703160</td>
<td>833</td>
<td>109956</td>
</tr>
<tr>
<td>12.5-12.9</td>
<td>26</td>
<td>4</td>
<td>33830</td>
<td>879580</td>
<td>742</td>
<td>19292</td>
</tr>
<tr>
<td>13.0-14.5</td>
<td>21</td>
<td>2</td>
<td>81500</td>
<td>1711500</td>
<td>1450</td>
<td>30450</td>
</tr>
<tr>
<td>14.6-16.0</td>
<td>77</td>
<td>10</td>
<td>66710</td>
<td>5136670</td>
<td>880</td>
<td>67760</td>
</tr>
<tr>
<td>16.1-17.5</td>
<td>9</td>
<td>2</td>
<td>286000</td>
<td>2574000</td>
<td>1450</td>
<td>13050</td>
</tr>
<tr>
<td>17.6-19.5</td>
<td>39</td>
<td>1</td>
<td>600000</td>
<td>23400000</td>
<td>4500</td>
<td>175500</td>
</tr>
<tr>
<td>19.6-20.5</td>
<td>46</td>
<td>10</td>
<td>1571000</td>
<td>7226600</td>
<td>1367</td>
<td>62882</td>
</tr>
<tr>
<td>20.6-22.0</td>
<td>16</td>
<td>2</td>
<td>135000</td>
<td>2160000</td>
<td>1314</td>
<td>21024</td>
</tr>
<tr>
<td>22.1-25.0</td>
<td>46</td>
<td>9</td>
<td>223700</td>
<td>10292000</td>
<td>1611</td>
<td>74106</td>
</tr>
<tr>
<td>&gt;25</td>
<td>7</td>
<td>1</td>
<td>70000</td>
<td>490000</td>
<td>1050</td>
<td>7350</td>
</tr>
<tr>
<td>TOTALS</td>
<td>1715</td>
<td>185</td>
<td></td>
<td>78,033,480</td>
<td></td>
<td>1,194,616</td>
</tr>
</tbody>
</table>

Table 2. Revised attendance figures

<table>
<thead>
<tr>
<th>Diam</th>
<th>#</th>
<th># rpt.</th>
<th>Av. Att.</th>
<th>Total Att.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0-4.4</td>
<td>115</td>
<td>8</td>
<td>9430</td>
<td>1084450</td>
</tr>
<tr>
<td>4.5-5.5</td>
<td>122</td>
<td>8</td>
<td>13030</td>
<td>1589660</td>
</tr>
<tr>
<td>5.6-6.8</td>
<td>258</td>
<td>14</td>
<td>9090</td>
<td>2345220</td>
</tr>
<tr>
<td>6.9-7.8</td>
<td>190</td>
<td>19</td>
<td>12260</td>
<td>2329400</td>
</tr>
<tr>
<td>7.9-8.5</td>
<td>174</td>
<td>8</td>
<td>22490</td>
<td>4371780</td>
</tr>
<tr>
<td>8.6-9.5</td>
<td>294</td>
<td>52</td>
<td>14870</td>
<td>3276000</td>
</tr>
<tr>
<td>9.6-10.5</td>
<td>120</td>
<td>8</td>
<td>27300</td>
<td>3276000</td>
</tr>
<tr>
<td>10.6-11.6</td>
<td>23</td>
<td>4</td>
<td>24000</td>
<td>3276000</td>
</tr>
<tr>
<td>11.7-12.4</td>
<td>132</td>
<td>23</td>
<td>35630</td>
<td>4703160</td>
</tr>
<tr>
<td>12.5-12.9</td>
<td>26</td>
<td>4</td>
<td>33830</td>
<td>879580</td>
</tr>
<tr>
<td>13.0-14.5</td>
<td>21</td>
<td>2</td>
<td>81500</td>
<td>1711500</td>
</tr>
<tr>
<td>14.6-16.0</td>
<td>77</td>
<td>10</td>
<td>66710</td>
<td>5136670</td>
</tr>
<tr>
<td>16.1-17.5</td>
<td>9</td>
<td>2</td>
<td>286000</td>
<td>2574000</td>
</tr>
<tr>
<td>17.6-19.5</td>
<td>39</td>
<td>1</td>
<td>600000</td>
<td>23400000</td>
</tr>
<tr>
<td>19.6-20.5</td>
<td>46</td>
<td>10</td>
<td>1571000</td>
<td>7226600</td>
</tr>
<tr>
<td>20.6-22.0</td>
<td>16</td>
<td>2</td>
<td>135000</td>
<td>2160000</td>
</tr>
<tr>
<td>22.1-25.0</td>
<td>46</td>
<td>9</td>
<td>223700</td>
<td>10292000</td>
</tr>
<tr>
<td>&gt;25</td>
<td>7</td>
<td>1</td>
<td>70000</td>
<td>490000</td>
</tr>
<tr>
<td>TOTALS</td>
<td>1715</td>
<td>185</td>
<td></td>
<td>78,033,480</td>
</tr>
</tbody>
</table>

Vol. 25, No. 2, June 1996

Planetarian 11
it skews the estimate to a value higher than it probably be.

To correct for this problem, I submit the following revised table. (see Table 1.)

Here I have changed three of the average attendance values (indicated by underlining) to what I considered more reasonable values. These are my subjective judgments; feel free to make up your estimates; your mileage may vary; may be fatal or harmful if swallowed.

One of the motivations behind this part of the questionnaire was to obtain a figure for how many warm bodies entered a planetarium and saw some sort of presentation during the past year. We can't provide a precise answer, but we are inclined to stick with it.

I would support an increase in dues to support an IPS staff member to make dupes and produce public domain slides for us just for the cost of production. How about it?

Yes, absolutely! IPS keeps on getting better and better! Let's just remember, we're related to astronomy first, computer hobbies a distant second!

Such a service would be great!

OK, if easier than downloading and copying myself. Also, I'd want them within 1 or 2 days of release by NASA.

Yes! Yes! Yes!

Wow! Great idea! Go for it!!

Be delighted!

8. How do you obtain such images now?

Table 3.

<table>
<thead>
<tr>
<th>Questions and answers. Total number of responders, 229.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Do you have access to the Internet? Yes, 165</td>
</tr>
<tr>
<td>[Everyone has access to the Internet if they have a phone and computer. Whether they choose to avail themselves of it is the question.]</td>
</tr>
<tr>
<td>6. If so, can you access NASA color images? Yes, 160</td>
</tr>
<tr>
<td>6a. Have you ever done so? Yes, 139</td>
</tr>
<tr>
<td>6b. Have you shot slides off the computer screen? Yes, 42</td>
</tr>
<tr>
<td>[Land then showed them to audiences? Who would be so unprofessional?]</td>
</tr>
<tr>
<td>6c. Or generated slides by some other method? Yes, 45</td>
</tr>
<tr>
<td>How? Film recorder, 14; print on color printer, photograph, 9; send to service bureau, 9; slide printer, 5</td>
</tr>
<tr>
<td>6d. Rate the quality of such images, compared to a good duplicate.</td>
</tr>
<tr>
<td>BETTER, 6; SAME, 37; WORSE, 40</td>
</tr>
<tr>
<td>[Depends on the service bureau. Some are better than others, but more expensive. You get what you pay for.]</td>
</tr>
<tr>
<td>7. Would you use high-quality dupes of such images? YES, 146; MAYBE, 65</td>
</tr>
<tr>
<td>[Depends on speed of service; if current method is faster, might be inclined to stick with it. And don't waste my IPS dues trying to provide them when they're freely available already.]</td>
</tr>
<tr>
<td>8. How do you obtain such images now? press kits, 2</td>
</tr>
<tr>
<td>ASP, 17; Internet, 14; other comm. vendors, 58; NASA, 39</td>
</tr>
<tr>
<td>at conferences, 8; ESA, 2; Other planetariums, 1</td>
</tr>
<tr>
<td>press kits, 2; STScI, 19; starshow packages, 8</td>
</tr>
<tr>
<td>[With great difficulty.]</td>
</tr>
<tr>
<td>9. Do you have video projection capability? YES, 157; NO, BUT I WILL SOON, 43</td>
</tr>
<tr>
<td>9a. What video hardware formats do you use? all, 2</td>
</tr>
<tr>
<td>b-cam, 5; b-SP, 5; computer graphics, 22; Hi-8 videotape, 5</td>
</tr>
<tr>
<td>laserdisc, 120; LCD projector, 2; PAL, 8; satellite dish, 5</td>
</tr>
<tr>
<td>S-VHS, 48; U-matic (3/4), 13; VHS, 109</td>
</tr>
<tr>
<td>9b. What are your sources of material? all, 1</td>
</tr>
<tr>
<td>ASP, 10; comm. vendors, 63; comp. software, 3; ESA, 3;</td>
</tr>
<tr>
<td>in-house, 17; IPS (?), 1; Internet, 7</td>
</tr>
<tr>
<td>laserdiscs, 5; Loch Ness, 1; NASA, 46; NASA Select, 5;</td>
</tr>
<tr>
<td>telescope f/1, 1; observatories, 3; PBS, 7; planetariums, 5; school library, 1</td>
</tr>
<tr>
<td>Sky-Skan, 55; starshow pkgs., 9; STScI, 1; from TV, 7;</td>
</tr>
<tr>
<td>various, 11; specialty sources, 2</td>
</tr>
<tr>
<td>9c. If you could get high-quality video masters at cost, would you? YES, 129; MAYBE, 60; CAN'T 2</td>
</tr>
<tr>
<td>This is great! Have been wanting such a service! What a relief for small planetariums!</td>
</tr>
<tr>
<td>10. Questions, comments, suggestions about anything pertaining to IPS.</td>
</tr>
<tr>
<td>It's time for a presence on the WWW.</td>
</tr>
<tr>
<td>Suggest info in Directory about what kind of observatory facility/program is offered or operational.</td>
</tr>
</tbody>
</table>

(Please see Questionnaire on page 45)
# International Planetarium Society


Keith Johnson  
Fleischmann Planetarium  
University of Nevada  
Reno, Nevada 89557 USA

### Profit & Loss Statement

<table>
<thead>
<tr>
<th>Income</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dues Income</td>
<td>25,560.95</td>
</tr>
<tr>
<td>Cash/Checks Dues</td>
<td>20,698.00</td>
</tr>
<tr>
<td>Credit Card Dues</td>
<td>4,576.95</td>
</tr>
<tr>
<td>Wire Transfer Dues</td>
<td>286.00</td>
</tr>
<tr>
<td>Interest Income</td>
<td>2,345.47</td>
</tr>
<tr>
<td>Spitz Fund Donations</td>
<td>90.00</td>
</tr>
<tr>
<td>Misc. Donations</td>
<td>2,993.00</td>
</tr>
<tr>
<td>Advertising</td>
<td>9,548.00</td>
</tr>
<tr>
<td>Mailing Labels Income</td>
<td>225.00</td>
</tr>
<tr>
<td>Publications Sales</td>
<td>5.00</td>
</tr>
<tr>
<td>Conference</td>
<td>456.47</td>
</tr>
<tr>
<td>Misc.</td>
<td>1,799.02</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td><strong>$43,022.91</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expenses</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planetarium Expense</td>
<td>19,546.41</td>
</tr>
<tr>
<td>Planet'n Printing</td>
<td>14,618.28</td>
</tr>
<tr>
<td>Planet’n Postage</td>
<td>4,414.06</td>
</tr>
<tr>
<td>Planet’n Misc. Expense</td>
<td>514.07</td>
</tr>
<tr>
<td>Directory Expense</td>
<td>6,566.26</td>
</tr>
<tr>
<td>Directory Printing</td>
<td>4,949.00</td>
</tr>
<tr>
<td>Directory Postage</td>
<td>1,605.26</td>
</tr>
<tr>
<td>Directory Misc. Exp.</td>
<td>12.00</td>
</tr>
<tr>
<td>Bank Charges Expense</td>
<td>219.12</td>
</tr>
<tr>
<td>Credit Card Fees</td>
<td>141.12</td>
</tr>
<tr>
<td>Wire transfer fees</td>
<td>48.00</td>
</tr>
<tr>
<td>Misc. Bank Charges</td>
<td>30.00</td>
</tr>
<tr>
<td>Instl. Plaques Expense</td>
<td>450.41</td>
</tr>
<tr>
<td>Other Costs</td>
<td>114.00</td>
</tr>
<tr>
<td>Refunds</td>
<td>51.00</td>
</tr>
<tr>
<td>Misc. Other Costs</td>
<td>63.00</td>
</tr>
<tr>
<td><strong>Admin. Expense</strong></td>
<td><strong>2,813.46</strong></td>
</tr>
<tr>
<td>Admin. Printing</td>
<td>206.24</td>
</tr>
<tr>
<td>Admin. Postage</td>
<td>1,321.10</td>
</tr>
<tr>
<td>Admin. Phone</td>
<td>184.22</td>
</tr>
<tr>
<td>Office Supplies</td>
<td>135.12</td>
</tr>
<tr>
<td>Office Hardware</td>
<td>527.82</td>
</tr>
<tr>
<td>Admin. Travel Exp.</td>
<td>425.96</td>
</tr>
<tr>
<td>Misc. Admin. Exp.</td>
<td>13.00</td>
</tr>
<tr>
<td>Committee Expense</td>
<td>312.01</td>
</tr>
<tr>
<td>Portable Planetariums</td>
<td>312.01</td>
</tr>
<tr>
<td>Conference expense</td>
<td>1,400.00</td>
</tr>
</tbody>
</table>

### Balance Sheet

<table>
<thead>
<tr>
<th>Assets</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking Account</td>
<td>8,867.06</td>
</tr>
<tr>
<td>Money Market Account</td>
<td>52,004.55</td>
</tr>
<tr>
<td>Planetarian Petty Cash</td>
<td>280.77</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td><strong>$61,152.38</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained Earnings</td>
<td>59,315.78</td>
</tr>
<tr>
<td>Current Year Earnings</td>
<td>1,836.60</td>
</tr>
<tr>
<td><strong>Total Equity</strong></td>
<td><strong>$61,152.38</strong></td>
</tr>
</tbody>
</table>

### Notes

1. Membership totals, 31 December 1995:
   - Individual: 525
   - Institutional: 87
   - Total memberships: 612
   - Library subscriptions: 31
   - Other: 13
   - Total subscribers: 656

2. Most of the "Office Hardware" expense is for a credit-card station (the little box a clerk swipes your card through). This makes it much easier for me to submit credit-card payments. It also eliminates a minimum monthly charge (called a "discount fee" for reasons I don't even try to understand) of $20 from the Visa/MasterCard folks in months where activity is low (meaning April through November for IPS).

   It also expands our credit-card horizons. IPS can now accept MasterCard (EuroCard), Visa, American Express, Diner's (yes, one member paid that way!), and JCB (a Japanese credit card).

3. At the start of 1995, I switched to a new accounting program (rather than my previous practice of setting up my own spreadsheets and linking them). This is why the above report may look a little different than my previous ones. This software follows standard accounting principles (better than I did before, at least), and doesn't allow me to make arithmetical mistakes. Not without some effort, anyway.

4. The entry under "Misc. Donations" was a contribution from Zeiss Corporation to help bring members from former Soviet countries to the October IPS Council meeting.

5. The expense shown under "Conference Expense" was for printing and mailing copies of the 1994 conference to IPS members who had not attended the conference.

6. The amount shown under "Special Adjustments" needs some explanation, at least if Jim Manning is still scrutinizing these reports as closely as he did when he was just a Council member. John Mosley maintains a petty cash account, which he uses for a variety of small expenses.

(Please see Financial on page 18)
Every planetarium seeks to keep its audiences returning for future sky shows. Improving the quality and delivery of recorded sound, voice, and music is often the step that a planetarium must take to continue to attract those audiences. The Adler Planetarium and Astronomy Museum in Chicago, these six existing speakers, the Sky Theater is now complete with fifteen new speakers and an enhanced speaker arrangement. Speakers are now located: one large speaker at the dome's zenith, one large speaker 30° up at each of the theater's compass points and half-points, and twelve smaller speakers positioned equally around the circumference of the theater (see accompanying diagram). With a new total of 21 speaker locations, the Sky Theater is now superbly equipped to provide audiences with all of the benefits from eight channels of audio made available with the installation of the USM.

It is well known that a planetarium has special audio requirements, as it can be a difficult space in which to achieve an even distribution of music and voice for the audience to hear in comfort. Larry Clupik, the Adler's sky show producer, says of its Sky Theater: "It is notoriously difficult to control and distribute sound in a theater like ours."

Of the newly installed USM and the Sky Theater's speaker upgrade, Clupik says: "Now we have more speakers in more places throughout the room, and we can control precisely where sounds are coming from whether it's background music, voices talking, or the launch of the space shuttle. The resulting sound has more impact and realism. It's not an increase in volume, but a strengthening of the sense of drama and wonder that goes with astronomy."

As is also well known, the sound quality in a planetarium can be enhanced in one of two ways, by upgrading either the entire existing sound system or its individual components. While either way sounds obvious, the former may become prohibitively expensive, while the latter may result in poor sound quality from mismatched audio components.

With the addition of the USM to balance its existing mix of audio components, the Adler's Sky Theater has achieved today an acoustic balance of audio fidelity and sound reproduction that was not attainable previously. And the modest changes which The Adler Planetarium undertook involved the addition and distribution of speakers that would aid the domed theater in achieving

(Please see Outer Space on page 56)
The star of your sky shows isn’t always in the sky

Let us show you how

we can make

each of your sky shows

a stellar performance

Or in the center of the room, either. Many think the planetarium projector in the middle of the theater is the only star of sky shows. While this is certainly true of many shows, the projector is just part of your audiences’ theater experience, and only letting your audiences see with their eyes.

You might ask, how does one follow a show any other way? Well, there is a product that lets your audience experience sky shows in a way you might not expect.

The Universal Sound Matrix is a revolutionary audio device that can augment the fine visual performance of your sky shows. While the projector in the theater favors your audiences to see with their eyes, the Universal Sound Matrix in the control booth invites them to see with their ears.

Your shows become not only a better visual treat, but truly a feast for the ears.

The Universal Sound Matrix is a remarkable advance in sound engineering, allowing your theater to surround your audience with perfect three-dimensional sound: properly mixed, cleanly balanced and evenly distributed to every speaker in your theater. No matter where they sit, every listener hears your shows equally, drawn by the action as it moves across the dome of your theater, their ears focused on the precision of sound in motion.

Call us for information or for a demonstration of the Universal Sound Matrix, a sound worth hearing.
Sound
Video
Interactivity
Laser disc players
Slide projectors
Interactive voting
Animatronics
Digital dimmers
Zoom lenses
Sound & light shows
Actuators
Fountains
Audio mixing
Computers
Sound editing
VCR's
Analog dimmers
X-Y mirrors & slew
Curtains
Strobes
Fog machines
Fireworks
Zoom lenses
Projection screens
Robotics
Automatic doors
One of them
Some of them
All of them
or 384 laser disc players
or 384 Slide projectors
or 3,072 relays
or 6,144 InterActive seat buttons
or 384....

The most flexible and expandable control system of them all

Omni Q® SMART™
Synchronized Modular Automated Response Technology

for more information contact Gregg Gillis at
Commercial Electronics Ltd
1335 Burrard St. Vancouver, BC Canada V6Z 1Z7
Telephone (604) 669-5525 Fax (604) 669-6347

Design and specifications are subject to change without notice. Omni Q® is a registered trademark of Commercial Electronics Ltd
As Bill Gates and crew keep reinventing Windows, the PC platform is growing closer to the Macs. What hasn't improved is the gap in size of the two systems libraries of available software, both standard and shareware. This disparity is especially acute in the area of astronomy software. That's why you'll see more reviews of PC-based astronomy software here than those for the Mac. That's why I'm pleased that Barry Hayes brought to my attention WorldClock Lite, which he found in cyberspace.

WorldClock Lite is a nice little Mac graphics program that emulates the famous Geochron™ display of the Earth's day and night zones. When activated, it sits on your desktop and continuously displays a colorful Mercator-like projection of the whole Earth showing the day/night terminator. This map also shows the sub-solar and sub-lunar points as well as the station location of the home site and five major world cities (Los Angeles, Rio de Janeiro, London, New Delhi, and Melbourne.) Below the world map are displayed five analog clock faces showing the local time of the five major cities along with their distances in miles from the station location. These clock faces are keyed by number to their locations on the world map and change from white dials when the city is in daylight, to gray when twilight is in progress, to black during night hours. An additional box shows the local stations current time in digital format.

By clicking on the 'WorldClock Lite' text in the menu bar, a pull down menu appears. This menu offers the startup display, labeled 'Clocks', and five others plus setup. The second menu item is labeled 'Sunrise Today.' It replaces the analog clock faces with information about local sunrise and sunset conditions. In addition to the times of sunrise and sunset, it displays the number of hours and minutes of daylight for the current day and the amount of change in that quantity from the previous day. It also lists the times of civil, nautical and astronomical twilight. Finally, at the bottom of the display, a simple bar shows all three twilights...
The 'Moon Below Horizon' option displays the moon's altitude and azimuth for the current location and current time of day. This mode also displays the clock time of local noon; the sun's altitude and azimuth; and the moon's altitude and azimuth. An 'animate' option allows you to see the sundial change as time is speeded up.

A spot check of WorldClock Lite's accuracy showed good precision for times of sunrise, sunset, and twilight. All twilight times were either spot on, or differed by only one minute from values calculated with the U.S. Naval Observatory's MICA program. Sunrise time was also identical but sunset was 2 minutes late.

All in all, WorldClock Lite is a delightful little shareware program that any planetarian with a Mac on their desktop will find useful and almost as attractive as having a Geochron on the wall—without the giant price tag! Who knows, if enough people buy programs like WorldClock Lite, maybe it will encourage astronomy software developers to create more for the Mac platform.

(Continued from page 13)

expenses, such as paying copyright fees, paying a typist to help enter material, etc. John sends me a detailed accounting of his use of this money periodically.

In past years, I have not shown this as an IPS asset (like our checking and money-market accounts); whenever I sent John a check to replenish this fund, I just recorded it as an expense. In 1995 I decided this was a little sloppy, so I created an asset account for this fund. But since there was money in the fund (i.e., in John's cash box, or wherever he keeps it), I had to account for this opening balance. I made it a "Special Adjustment."

7. MOST IMPORTANT! PLEASE READ! Even if you received this copy of the Planetarian in the mail, you may still not be a current member! Following IPS rules (as uncovered by a recent expedition into the vaults), I kept everyone as an active member for the first six months of 1996, even if I never received dues. But you will not receive any more publications, including Directory updates and he Planetarian, if you haven't paid up. Check your address label. If the year shown after your name is 95 or smaller, you are currently in the actuarial class moriturus pulsarus (or "dead beat," for you non-accountants), and need to send me some money.

Some of you may have waited to pay dues until the Osaka conference. Be sure to check your receipt for the conference, to make sure that fee is listed. I should be able to get everyone's name by mid-August when I send John the mailing labels for the September Planetarian, but there are sometimes delays, especially for a conference held in a country other than the one your humble treasurer lives in. We'll do the best we can.

And who knows? Maybe the next treasurer will be able to count with his socks on!

Submitted by:
Keith Johnson
Fleischmann Planetarium
University of Nevada
Reno, Nevada 89557 USA

Vol. 25, No. 2, June 1996

(Continued from page 13)
SHOW KITS AVAILABLE FROM THE
DAVIS PLANETARIUM

DON'T DUCK, LOOK UP!
A fun, friendly and interactive exploration of the sky!
Designed especially for Pre-K through 1st graders, this is an ideal first show for primary school audiences. Your presenter conducts this program blending live interaction with prerecorded segments.
• 20 minutes / 108 slides / $450

LIFE BEYOND EARTH*
Consider the possibility of life elsewhere in our galaxy and throughout the universe.
• 31 minutes / 368 slides / $350

DESTINATION: UNIVERSE, OUR FUTURE IN SPACE*
Journey into the future from a space station out to the stars.
• 38 minutes / 321 slides / $350

WORLDS OF WONDER*
Investigate some of the exciting discoveries made about the worlds in our Solar System.
• 25 minutes / 314 slides / $350

PARTNER * SHIP * EARTH*
Explore our planet from its violent birth to today and see how its wealth of resources make life possible. Find out how we can better preserve and enjoy the future of the world.
• 25 minutes / 250 slides / $350

* Programs funded by the Westinghouse Electric Corporation

PRODUCTION KIT INCLUDES:
• Production Book with annotated script, visual list, special effects notes, and educational materials
• Soundtrack on cassette, Dolby B, C or dbx
• Slides

PLEASE SEND ORDER TO:
Distribution, Davis Planetarium
Maryland Science Center
601 Light Street
Baltimore, Maryland 21230

Make check or Purchase Order payable to:
Maryland Science Center

Indicate preferred noise reduction:
Dolby B, C or dbx

For more information call the Davis Planetarium at
410.545.5976
or fax inquiries to
410.545.5974

MARYLAND SCIENCE CENTER
Focus on Education

Stu Chapman
Planetarium Director
Southampton Middle
Moores Mill Road
Bel Air, Maryland 21014

What's Your Limit?
A Planetarium Lesson on
Stellar Magnitude and Light Pollution

Russell Waugh
Planetarium Director
Howard B. Owens Science Center
9601 Greenbelt Road
Lanham, MD 20706
(301) 918-8750
rwaugh@umd5.umd.edu

Recommended for grades 6-12.

Introduction
The apparent brightness of a star is one of the fundamental measures we can make in observational astronomy. Furthermore, it can be accomplished by eye alone with the aid of a star chart. Astronomical observers typically characterize the viewing conditions on a given night by the limiting magnitude, the faintest star visible at the time. A convenient group of stars for northern hemisphere observers is formed by Ursa Minor (the Little Dipper) since its stars are circumpolar for most of us. The accompanying chart of the Little Dipper can be used by students in the planetarium or under the real sky to determine the limiting magnitude at their location. In the planetarium, light pollution can be simulated to discover the effects of this problem on the visibility of the night sky.

Objective: Given the accompanying chart and the planetarium sky, the student will determine the faintest star visible under various conditions. This activity will familiarize students with the magnitude system and foster awareness of the problems light pollution poses to astronomy.

Materials: Star chart of the Little Dipper, with magnitudes; worksheet with chart and graph; flashlight; pencil; planetarium (or slide of the Little Dipper).

Background: The modern magnitude system descends from that developed by Hipparchus. Bright stars are designated by low numbers (the brightest have negative magnitudes), faint stars by higher numbers. Star magnitudes can be estimated by eye by comparing unknown stars with those of known magnitude. In the present exercise it is only necessary to find the faintest star visible and record it in a data table.

Procedure: Review the following procedure with students
1) Study the chart of the Little Dipper. Magnitudes are marked to the nearest tenth with decimal points omitted (to avoid confusion with star dots). Thus, the magnitude of alpha UMi (Polaris) is 2.0, although it appears on the chart as 20. Note that the higher the magnitude number, the fainter the star.

Use red-covered flashlights once the lights in the planetarium are down. Spend 5 minutes becoming dark adapted.

2) Compare the chart to what is seen in the planetarium sky. Record the magnitude of the faintest star visible in the chart (in the space for zero percent light pollution).

3) Bring the cave lights in the planetarium up a little at a time, stopping periodically to allow students to record the limiting magnitude under various light-polluted conditions. [Instructor: attempt to stop with the light level at approximately 25%, 50%, and 75% of full brightness.] If possible, record the level of light in the theater as a percentage of full brightness. A photographic light meter might be used to record the level of brightness. Students should record the limiting magnitude for each level of light pollution in the chart.

4) Plot the results on the accompanying graph.

5) Encourage students to repeat the observation at home, on a moonless night. In this case, it will be necessary to record the meteorological conditions (haze, etc.) as well. In general, avoid hazy nights so that the results obtained by all students in the class will be easily and reliably comparable.

6) After completing step 5 above, plot the limiting magnitude for each student's location on a map of the area. Connect lines of equal magnitude ("isomags", if you will) to show the limiting magnitude in the area.

Many local amateur astronomy clubs support efforts to reduce light pollution. Some even conduct observations of the sort described here to map light pollution trouble spots in their area. The International Dark Sky Association has information about light pollution, and provides instructions on how to observe magnitude limits, and even how to calculate theoretical limits based on proximity to major population centers (see references). The Association also sells a set of slides depicting various sources of light pollution and some possible solutions to the problem.

References and sources:
Sky and Telescope, Dec. 1992 (Little Dipper Chart)
"Estimating the Level of Sky Glow Due to Cities." International Dark Sky Association, 3545 Stewart Ave., Tucson, AZ 85716. This and a variety of other information sheets can be obtained by mail or from their web site: http://www.darksky.org.

(Worksheet is on following page)

The Planetarian is now online!
The Planetarian now has a World Wide Web page on the Internet. Please visit it at:
http://home.earthlink.net/~jmosley/Planetarian

Vol. 25, No. 2, June 1996
The Little Dipper

Magnitudes of stars (decimal points omitted)

Limiting Magnitude and Light Pollution

<table>
<thead>
<tr>
<th>% Light Pollution</th>
<th>Limiting Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
East Coast Control Systems
Manufacture • Install • Service • Maintain

Also available: Slide Projectors • Projector Racks • Special Effects • Laser Equipment • Video Equipment • Audio Equipment • Theater Upgrades and Maintenance • Technical Support • Hardware and Software Development • On-Site Consulting Services

East Coast Control Systems
(407) 631-9799
Regional Roundup

Lars Broman
Broman Planetarium
Ostra Hamngatan 1
S-79171 Falun, Sweden
+46 2310 177
+46 2310 137 fax
lars.broman@planetarium.se

This column depends entirely on contributions that I receive from IPS Affiliate Associations all over the world. Please continue to contribute as you have done before. To be sure that your text makes it into the column, please make sure that I have it at the first day of the Planetarian deadline month. The deadline for contributions to No. 3 is thus 1 July, and for No. 4 is 1 October.

Thanks to Ignacio Castro, Undine Concannon, John Hare, Marc Moutin, Loris Ramponi, Fred Stutz, Zinaida Sitkova, and Erich Uebelacker for contributing to the Regional Roundup column. You are welcome back with new reports, and I look forward to reports from other associations as well. Please remember that a short note is also appreciated!

Association of French-Speaking Planetariums

The last APLF annual meeting was held at the Reims Planetarium the 3-5 May '96. Because of the printing deadline, a short summary of these three days in the Champagne area will be reported in the next issue of the Planetarian.

The second issue of the French Magazine Planetarium is now available. New columns are proposed: a general astronomy paper from Hubert Reeves, a catalogue of all the shows proposed in French planetaria, and a European page presenting planetariums from different places in Europe. You will also find the usual sections as the proceedings of the 95 APLF meeting and the complete directory of all the French planetaria. Those who are interested in improving their French, please contact Strasbourg Planetarium or Paris-La Villette Planetarium.

A working-group Links with Planetariums has been created at the first conference of the EAAE (European Association for Astronomy Education) in November '95, in order to strengthen the relationships between teachers and planetarians and to try to exchange more information concerning the different experiences in these areas. You can join us by contacting Paris-La Villette Planetarium (e-mail: moutin@worldnet.net).

A new big planetarium opened last October in Vaulx-en-Velin near Lyon. With a 15 meter dome and 150 unidirectional seats, it hosts the first Digistar projector in France. Its dynamic team created two new shows for the opening and proposes school programs, debates, and "apero-sciences", a new style of conferences where an apéritif is served to the public. A really French Planetarium!

A new planetarium opened in Tunis, Tunisia last March. The projector is an SN 88 II from the French company RS Automation. The first shows have been created by the Planetarium of St Etienne. Two other big planetariums are in the project stage: the first one in Villeneuve d'Ascq near Lille (Northern France), the second in Toulouse (South Western France).

New original shows have recently been developed in different places: Ombres et Lumières de la Voie Lactée (Shadows and Lights of the Milky Way) and 1, 2, 3 Soleil (1, 2, 3 Sun) in Vaulx-en-Velin, A la recherche du ciel perdu (Looking for the Lost Sky) in Strasbourg, and Mars 2035 in Paris-La Villette.

After the astronomical events followed by the French planetaria (lunar eclipse or comet Hyakutake last April), several events are scheduled in different areas: The Marseille Observatory & Andromeda Association will organize a great party, The head in the stars, 22 June. The Planetarium of Vaulx-en-Velin will in June open a new exhibit, Volcanoes in the Solar System. The Planetarium of Strasbourg has opened a new exhibit, The creation of the world. The Planetarium of St Etienne is preparing a new show about comets.

Association of Mexican Planetariums

At the XXV AMPAC Meeting, the planetarium of the Museo de Ciencia y Tecnología de Veracruz was accepted as an AMPAC member. It has a 6.5 meter dome, a seating capacity of 50, and was financed through a private donation. It will be used for teaching of astronomy by its young staff. Arq. Miguel A. Berdejo (Director) and Adrian Guzman are responsible for the planetarium. Address: Ave. Murillo Vidal s/n Xalapa Veracruz, phone +52 2812 5088, fax +52 2812 5110.

The meeting agreed upon the following: to make an updated resource list of services and materials offered by the planetariums; to pay membership dues; to meet once per year in a general conference; to expect to use Internet as well as e-mail by all planetariums who have access to it; to increase information exchanges; to contribute news to be sent to the Planetarian Regional Roundup column; to try to attend the triple association meeting (RMPA-SWAP-AMPAC) in El Paso, Texas in the fall of 1996; to assemble a pictorial album with photos and logos of all planetariums to be exhibited at all facilities in Mexico; to develop an information brochure about AMPAC; and to integrate Astronomy Societies with planetariums.

The Luis F. Erro Planetarium has actively coordinated an Astronomy Festival for children and has offered telescope observations of comet Hyakutake.

British Association of Planetariums

Armagh Planetarium's new director is to be Tom Mason, currently Professor of geology at the University of Natal, South Africa. He takes up the reins on 1 July.

Dundee Mills Observatory & Planetarium celebrated its 60th anniversary in October 1995 with a civic reception followed by a talk on The Universe 1935 by City Astronomer Brian Kelly. For this occasion he was dressed in period costume, aided by a period glass lantern projector and slides to match. Guests were also able to enjoy views of Saturn in the Observatory's 10-inch refractor. After this splendid start, the winter season continued with visits of schools and evening groups as well as regular planetarium shows.

Edinburgh Royal Observatory's Visitor Centre is undergoing a major transformation. A computer suite is being created, allowing access to astronomy resources on the Internet. Slide shows are given on topical items and on the Observatory's work. Hands-on exhibits on light, lenses, the eye, color, and perception are to be installed in May, with the aim of creating a modern interactive center at the forefront of space and astronomy presentations to the general public and school groups.

Glasgow Planetarium Project is still waiting to know if they will qualify for Millennium funding.

National Science Week culminated for London Planetarium in the Finals of the planetarium's very successful Astronomy Challenge for schools, Rising Stars. This was a Quiz for Secondary Schools, which the planetarium plans to make a national event next time in cooperation with other planetaria and science centers. The number of budding astro-physicists among the contestants was quite surprising! Primary schools were offered a musical workshop, First Kids in Space, as a double bill with their usual curriculum program. The staff has found the
tunes irritatingly catchy! The planetarium's first Digitar Astro-Navigation program had a larger audience than usual - some said they found its sky rather more familiar than the old Zeiss sky ...

John Hare from Florida has just completed a major service on the London Caird Planetarium's Spitz projector, making it virtually new. Ultraviolet rays from the Xenon arc star lamp had deteriorated the projection foils and lenses, and these have been replaced. The projected sky is apparently awesome! Harry Ford thinks it is now as close visually to a real sky as possible to get in a planetarium, even to the different star colors. The machine now functions perfectly for the public shows and the infant programs which form the bulk of bookings.

Northampton Portable Planetarium was launched on the county's schools in March 1995. 6000 children have seen the curriculums programs, and some sessions have been open to parents and the general public. During National Science Week these were these were heavily over-subscribed. There are plans to increase public presentations if demand is sufficient.

Eva Hans of South Tyneside College Planetarium was amused to find in a school group, which recently made a visit, a boy named Leo, two girls called Cassiopeia and Pleiades, and someone who had a cousin called Pegasus. Is this a record for one class?

Paul England of Fort Victoria Park Planetarium reports a third season of growth, and the accolade of a Business Success Award to 900 local school children and 3000 visiting the Isle of Wight on holiday saw planetarium shows last summer, plus a constant stream of other visitors who also had the choice of seeing an Astro film every week. The weekly show Stargazing for Beginners was a sell-out success, and the Stargalb club now meets twice a week. There is now a new planetarium theater with video as well as panorama and all sky systems, but live stargazing presentations will continue to be an important part of the program. Loch Ness has come to the island in the form of More than Meets the Eye, adapted for British latitudes.

Council of German Planetaria

In Germany there are approximately sixty planetaria. There are two planetarium organizations. All the planetaria of Germany, Austria and Switzerland are very loosely organized in the Working Group of German Speaking Planetaria (Arbeitsgemeinschaft Deutschschprachiger Planetarien, ADP). This organization holds one meeting per year, which is open to anybody working at planetaria and to companies selling shows, special effects, etc.

Nineteen larger planetaria with full time staff are members of the Council of German Planetaria (RDP). These planetariums had a total of 1.6 million visitors in 1995 (1994: 1.3 million). All the sixty planetaria had about 2.2 million visitors.

There was one ADP meeting in 1995, in Kiel 29 April - 1 May. 120 persons participated, including guests from Denmark, Poland and the U.S.A. A large number of companies presented software and hardware. The organization was perfect and everybody enjoyed the time in Kiel, the major city of Schleswig-Holstein in northern most Germany.

There were also two RDP meetings during 1995, in Kiel and in Hamburg. A new Chair, Erich Uebelacker of Hamburg Planetarium, was elected in April. The next ADP and RDP meetings will be held in Jena, where the first planetarium of the world was presented, 21-22 April 1996.

In spite of increasing numbers of visitors, many planetaria suffer from the difficult financial situation of German communities. Some of them, e.g. those in Recklinghausen and Leipzig, are in danger of being closed. The Chair of RDP keeps in contact with the authorities responsible for culture and education in these cities. He hopes to find solutions so the work in the planetaria may continue.

For the remaining planetaria, 1996 seems to be a good year. Three eclipses and at least two bright comets will be very helpful.

Italian Planetaria's Friends Association

The main Italian Planetarium in Milan has been closed for seven months, and could reopen in March after the solution of some bureaucratic problems.

During the National Week of Scientific Culture, promoted in many Italian cities last March by the Ministry of Science Research and Technology, a Starlab planetarium was opened in Genova. The inflatable dome occupies a section of the temporary exhibition named Learn and Play organized yearly since 1994. The promoter of the initiative is prof. Giuseppe Gambardella of the Engineering Department, University of Genova (address: DISt, via Opera Pia 13, Genova).

In the city of Florence there are three planetaria: one in the Museum of History of Science (Galileo model), one not in use that is waiting for the opening of a medium planetarium (ZKP2 model), and the third which opened in March (Goto EX-3 model). The last is managed by the amateur astronomers of the Astronomical Society of Florence and is installed in a secondary school (Scuola media Barsanti, via Torri 28/A, Firenze).

The XI National Meeting of Italian Planetaria will take place in the city of Bologna, 6 October 1996. The organisation of the Meeting at local level will be chaired by prof. Angela Turricchia, teacher of the Aula Didattica Planetario (Scuola G. Carducci, Via Dante 5, Bologna). Last November prof. Turricchia participated in the second meeting of European Association for Astronomy Education (AEEA) in Athens.

This year's Day of Planetaria involved planetaria from many European countries: Belgium, Bulgaria, Czech Republic, Denmark, France, Italy, Lithuania, Poland, Russia, Slovakia, and Ukraine. For the next year (23 March 1997) an international contest for the logo of the initiative has been organized. Entries must be submitted to the Contest Secretary (Centro studi e ricerche Serafino Zani, via Bosca 24, 25066 Lumezzane, Brescia, Italy) before 15 October 1996. An international committee will choose the best work among the drawings presented. Persons interested in the contest are invited to ask for the contest rules (or turn to page 54).

Middle Atlantic Planetarium Society

Check us out on the Internet! Thanks to Don Knapp, MAPS has a home page on the world wide web listing information about officers, committees, membership etc. Included are links to planetarium vendors, other planetarium web pages, and astronomy web sites. To access Don's DOME Page, the URL is: http://www.voicenet.com/mcdonald. If you would like to communicate with don about his home page venture, his e-mail address is: mcdonald@voicenet.com. This year's conference is held in Boston, MA, 8-11 May. Next year's conference will be held in Providence, RI; dates pending.

Nordic Planetarium Association

Comet Hyakutake was extremely visible from our high latitudes, passing between Ursa Major and Ursa Minor when it was at its largest. Information about Hyakutake was available on Internet at Tycho Brahe Planetarium’s homepage. Among the public comet presentations were the several late evenings at the top of Falun's major ski jump tower with over sixty comet hunters at the most crowded evening.

June will be a busy month for Nordic planetarians. The distance course Popular science with emphasis on the didactics of science centers at Dalarna University begins 8-9 June (more info. from Ibr@du.se). The yearly Starlab driver's license course takes place in Ransta 11-13 June (per.broman@planetarium.se). The First World Science Center Congress takes place at Heureka (home of Verne Star Theatre) in Helsinki-Vantaa 14-17 June
(helena@heurekaJi). A Mobile Planetarium Workshop with Per Broman, Susan Reynolds and Philip Sadler as teachers takes place in Falun 18-19 June (for details please contact lars.broman@planetarium.se).

Russian Planetariums Association

The program of the Russian Planetariums Association Annual Conference 1996 included two days in Moscow (28-29 February), and one day in Star City near Moscow, in the Russian Space Center (1 March).

Seventy-five representatives from twenty-seven planetaria from all over the Russia and other Independent States came to the conference. The conference didn’t acquire any financial support. Owing to this, the number of participants and guests was less than expected. The organizers (Nizhny Novgorod Planetarium, being in Nizhny Novgorod (400 km from Moscow), faced great troubles and unexpected problems in preparation of the conference in Moscow, the most expensive city in Europe, without any financial support. Despite all the difficulties, the RPA Conference was successfully completed.

The program of the first day included reports of leading Russian astronomers (from Euro-Asian Astronomical Society, Sternberg Astronomical Institute, and Institute of Space Researchs of Russian Academy of Sciences), planetarium directors and writers, and representatives from relative organizations (amateur observatories, publishers, etc.). In the very beginning, the Greetings from the President of the IPS James Manning were announced. Nizhny Novgorod Planetarium reported live from the Hubble Space Telescope Program in Russia.

The second day of the Conference included an open discussion on the present and future of Russian planetaria, with participation of representatives from the Ministry of Education, Ministry of Culture, and the All-Russian Society Znanie (Knowledge), the former owner of all the Soviet planetaria. For the first time, attention of the governmental structures was given to the specific problems of Russian planetaria. All the participants of the discussion decided to continue their efforts to create the legislative basis and guarantees for the planetarium activities in Russia.

The last day of the conference was dedicated to a visit to the Russian Space Center in Star City near Moscow. Conference participants and guests had the unique opportunity to see and touch both a Soyuz spaceship and a Mir station, the 18 m main centrifuge of the Space Center, the Flight Control Center, and (most impressive!) the unique planetarium of the Space Center, where cosmonauts study astronomy, navigation, orientation, and flight control. The planetarium shows 10,000 stars, the sky view from orbit. In the center is Buran’s pilot cabin with complete navigation equipment. Sitting inside it, you can get the real feeling of space flight!

The Director of the Space Center Planetarium was glad to join Russian Planetary’s Association. He and his staff are very interesting people. The head of the division that the planetarium belongs to is cosmonaut Vladimir Djanibekov, the legend of Russian space flights. He is an amazing man. It is hoped that the new contacts will be interesting and helpful for RPA as well as for IPS.

The Conference attracted the attention of media, including national TV and radio channels. It proved that astronomy and planetaria in Russia are still alive despite the collapse of Russian science and education. Conversations and discussions however showed that now Russian planetaria cannot look forward to satisfactory support of the state. The good news is the strong will to develop the cooperation and exchanges between Russian and Ukrainian planetaria (representatives from four Ukrainian planetaria came to Moscow). Together with Ukrainian Planetariums Association, we decided that the next RPA & UPA Joint Annual Conference will be held in Kiev in May 1997.

International Day of Planetaria 1996 and Comet Hyakutake in Nizhny Novgorod and in Russia. This year’s Day of Planetaria (Sunday, March 24) coincided with the closest approach and maximum brightness of comet Hyakutake. The comet became the great attraction of public interest in events in many planetariums.

Nizhny Novgorod Planetarium began to prepare the Great Comet Coming in the end of February. We announced information on the comet via local mass-media. TV, radio and newspapers showed very great interest in the event. As a result, many people waited for the comet’s appearance in the skies with great impatience. During the whole Comet week (21-28 March) the planetarium was overfilled. In the Day of Planetaria, we even had to organize extra shows (due to public demands). That evening the skies were amazingly clear and hundreds of people came to the planetarium and observed the comet. The entrance was free, and we don’t know exact number of visitors - 300 as a minimum! This was a fine completion of the Day of Planetaria program.

Most of the Russian planetaria also participated in the Day of Planetaria and showed the comet. And now all of them say Good Bye to the comet with great appreciation.

Finally, please note that RPA has a new e-mail address: sitkova@plan.scinnov.ru

Southeastern Planetarium Association

The 1996 SEPA Conference is scheduled for 18-22 June 1996. The host facility is the Sudekum Planetarium in Nashville, Tennessee. For further information and/or late registration, contact Kris McCall, Director, Sudekum Planetarium, phone (+1) 615 862 5160, fax: (+1) 615 862 5178.

The 1997 SEPA Conference will be hosted by the Space and Science Theater at Pensacola Junior College, Pensacola, Florida in June, 1997.

Dave Hostetter’s A4 planetarium in Lafayette, Louisiana has been reopened after a several year hiatus due to structural problems. Mike Sanders reports that the Kenner (a suburb of New Orleans, Louisiana) City Council has approved plans for a 50 foot planetarium to be constructed next to their existing facility. Jim Mullaney (formerly of Spitz) is directing a new 45 foot Digistar facility in Aiken, South Carolina.

Kris McCall (conveniently) in preparation for SEPA ’96, has installed a new control system by East Coast Control Systems, and Bowen Productions has upgraded the sound system at the Sudekum. Long-time Savannah Science Museum Planetarium Director Vicky Psillos Watson has resigned her position to return to school for an advanced degree. Erich Lindstrom is the new director.

Ian Griffin, formerly of Armagh, Northern Ireland, arrived shortly before Christmas to assume the directorship of the Brevard Community College Planetarium in Cocoa, Florida. He has recently contracted with former Buehler and John Young Planetarium staffer Mark Howard and Page Hare Howard to produce two laser shows for the BCC facility. John Hare, director of Bradenton, Florida’s Bishop Planetarium, resigned effective January 31st, to pursue his technical service and consulting business (Ash Enterprises) on a full time basis with partner Eric Melenbrink. George Fleenor has been appointed Acting Director at the Bishop.

Finally, a controversial change to the SEPA bylaws, enacted at the 1995 Conference, was upheld by a committee headed by Mike Chesman of the Bays Mountain Park Planetarium, Kingsport, Tennessee. The bylaws change allowed vendors within the SEPA region to have full membership privileges including voting and serving as an officer. Previously, only planetarium staffers were allowed this privilege. SEPA, unlike most other regions, however, still excludes any individual outside of the region from voting and/or holding office.

Vol. 25, No. 2, June 1996
The GSS-Helios (GSX) features 25,000 stars reproducing a sky seen only from space. Digital shutters mean panoramas without stray stars twinkling through the image. Computer-assisted functions give manual mode the ease of auto mode without replacing the lecturer. The list of special GOTO features goes on and on. Contact your nearest representative and find out what your planetarium could be like.

The G1014si offers Space Simulator functions plus GOTO’s exclusive automatic lamp replacement mechanism. No more shows lost to lamp burnout. With the G1014si, your spare lamp leaps into action with a simple touch of a button at the console. Simple, fast and efficient. That’s a GOTO Planetarium.
Book Reviews

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

The stars of the season wheel into the night sky, and excellent books appear. Here are some to collect, some to avoid, some for children, some for your bookstore or gift shop, some to tuck into a knapsack and take on a hike. And if you'd like a free book to review, contact me at the address above or through e-mail. Happy Solstice!

Thank you to our loyal reviewers for this issue: John Appeldoom, Bob Ballou, Robert D. Hicks, David DeRemer, Francine Jackson, Wayne James, David Maness, John Mosley, Mark Rosauer, and Steve Tidey.


Reviewed by John Appeldoom, Savannah Science Museum, Savannah, Georgia, USA.

How does one get a child interested in science? A good way to start might be to read this book, a biography of Eratosthenes, the ancient Greek who asked questions since early childhood, and finally found a way to measure the circumference of the earth, and this by hardly having to leave home.

In just 48 pages, the author covers Eratosthenes' life from a baby to an old man. We go to school with him, follow his expanding career. We learn about Greek life and about the Greek cities of Athens and Alexandria. We are even introduced to some little-known Greeks: Herophilus, who first recognized the difference between arteries and veins, and Ctesibius, who invented a water-driven clock.

Eratosthenes himself was a man of many parts: a poet, musician, astronomer, geographer and botanist, and most of all, Chief Librarian of the most important library of the age, that at Alexandria. But Eratosthenes' chief claim to fame was measuring the earth. The final third of the book relates in great detail, and understandable to a nine-year-old, the steps that had to be taken. The result was amazingly accurate: a circumference within 200 miles of today's figure.

The illustrations done by Kevin Hawkes are as important as the text, clarifying and expanding our knowledge of life in those times. We see their dress, their homes, and their monuments, temples, libraries, and cities—dozens of little details that need to be searched for and enjoyed.

This book can be read by fourth or fifth grader, but it is probably best read aloud by a parent or grandparent. There is so much to discover on every page that it is sure to delight.


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

An astronomy professor at the University of Virginia, Trinh Xuan Thuan has written an entertaining new addition to a genre of popular science book made famous by Carl Sagan, Paul Davies, and Timothy Ferris. This genre provides an outline history of the evolution of the cosmos, from Neolithic artistic representations to the latest developments in quantum physics. Books of this kind are tempered with philosophical digressions (usually not as sophisticated or insightful as the discussions of physics) and present inventive analogies to help general readers interpret astrophysical notions that oppose common sense (such as the space-time dilatation effect).

Thuan, in fact, is known as the "French Carl Sagan" because of his popularizing of astronomy in France (where The Secret Melody was originally published). In fewer than 300 pages, Thuan seeks to outline the sum total of our knowledge about the nature and evolution of the universe. To do this, he parcels key concepts under numerous subheadings, each concept generating several paragraphs of prose. Although jargon is minimal, recurring important terms are explained in a glossary. Ambitious readers are referred to an appendix in which some concepts (such as the uncertainty principle in quantum mechanics) are framed in mathematical language. The text, surprisingly, is accompanied by very few photographs (all black and white) and few diagrams.

Thuan introduces a thread connecting developments in cosmological thought—the secret melody referred to in the title—as a distant tune reflecting our cosmology of the moment. The melody, he suggests, has changed over time, from the "cavemen" of Lascaux to the present day. He explains:

Nature is by no means silent. Like some distant orchestra, it tantalizes us with individual notes and fragments of music. But it is not willing to hand everything to us on a plate. The melody linking the individual fragments of music is missing. The overall theme is hidden. Somehow we have to unravel the secrets of that hidden melody, so that we can listen to the composition in all its glory.

I found the "secret melody" motif rather forced. A motif Thuan uses that makes more sense is the Ptolemaic versus Copernican shift in realizing a cosmos centered upon earth—and man—and one which displaced our pre-eminence. Further, although the book's news release promises that Thuan tackles such questions as whether the universe has a Creator, the existence of life on other planets, and the relationship between space and time, these discussions are unsatisfactory.

Thuan's finest moments concern discussions of contemporary quantum physics. His terse but insightful explanations are easy to digest and relate to a larger theme. His extrapolations into the future are provocative, such as a scheme to "tame" black holes by feeding them cosmic debris in return for energy.

On philosophical issues the book is disappointing. The news release promises a provocative argument for the "anthropic principle," an argument for purpose and determinism in the universe (a return to a near-Ptolemaic view). Thuan, like others drawn to this (in my view theological) perspective, notes the astounding coincidence of finely-tuned physical constants in the observable universe, of which any slight variation means that we would not exist. While noting hubris in the argument that the universe had to be what it is because we are here (or, that the universe had only one direction, the evolution of man), his discussion is muddy. He concludes by posing two possible viewpoints in light of physics that a supreme being exists who is the author of physical laws and who as "fine tuned everything," or else all is chance, predicated on the possibility of "multiple, parallel universes." Thuan opts for the supreme being, that anything unverifiable "violates [his] sense of simplicity and economy." Rather than view life within a cosmic framework of chance (and its attendant "nonsense and despair"), he
votes for a friendly universe of "sense and hope." Well, we didn't need this book to arrive at such a conclusion.

I recommend Thuan's discussion of contemporary physics for the educated, general reader. His anthropic ambiguity, sparse and cliched analogies to explain complex concepts, oversimplified discussion of pre-Newtonian cosmologies, and everything placed within a narrative of progress to our enlightened late-20th century present, detracts considerably from the book. Thuan might have written instead a shorter book about findings in modern cosmology.


Reviewed by David Maness, Virginia Living Museum, Newport News, Virginia, USA

When I saw this book, I was excited by its lively appearance. The cover with the close-up of Jupiter's awesome swirling clouds and moons is striking and attractive. The shiny smooth cover and pages make it pleasant to touch. The book has an ample supply of beautiful astronomical pictures as well as interesting fonts and colorful diagrams. Just the thing to encourage a budding young scientist, I thought.

The book is well organized, at least in the table of contents. Chapters 1 and 2 (of 7) cover the planning and spacecraft operation respectively. The next four chapters handle the planets they visited. These chapters are divided into two sections: "What we knew" and "What we learned". Chapter 7 is a brief overview of the highlights and a few words about the future of the craft as they drift ever farther from the solar system. I was glad to see the book includes a glossary, an index and a list of books for further reading. Some of the terms like "hypergolic fuel" and "gravitational propulsion" are not for the beginner. Unfortunately many glossary definitions are woefully inadequate; eg, "Comet - A celestial body with a bright head and a long tail."

The organization doesn't hold up on the text level. Something about the wording and sentence structure bothers me. The text is readable but has little prosaic quality. It often requires rereading to see how one sentence leads to the next. Very often the connection is not easy to discover. Within each section the ideas seem to jump around.

Although the author is writing for children, it seems that the ones he has in mind have the attention spans of flies. I personally find this attention deficit style of writing extremely irritating to read. The editors must share a great deal of the blame here. After all, they are the professionals who should know how to write for children. I would have liked to see an effort at mental imagery, or maybe a few questions to encourage the reader to think.

The text ranges from overly-simplified to overly-technical. Maybe this is an effort to appeal to a wide range of ages. One sentence about Triton reads, "With polar caps crusted with methane and nitrogen, it is the coldest place ever measured in the solar system." What is the temperature? The author never answers that question. Later he writes, "Winds on Saturn were found to be the fastest in the Solar System." Again, he never answers the questions that many children will ask: How fast were they?

Many of the sentences are awkward.

"Before Voyager 2's arrival at Neptune in August 1989, the only view we had, even through the best telescopes, was that of a fuzzy speck." This 28-word sentence and others could have been rewritten for ease of reading and better flow of ideas. As a children's science book it is watered down. It does not excel as children's literature either.

On the other hand, the book was not all bad. It has beautiful pictures, follows a historic journey, and tells a little about the process of science and exploration. I wish I had written it myself, but I would have taken the time to correct some of the literary problems.

If I had children, I would want them to learn about the Voyager mission and others, if they wanted to read further. **Mission to Deep Space** is a place to start, mainly for the pretty pictures. I hope there are more and better books to come however. This book just doesn't find its niche.


Reviewed by David A. DeRemer, Charles Horwitz Planetarium, Waukesha, Wisconsin, USA.

This book, illustrated with over 100 drawings, tables and photographs, highlights and details the journey of the Voyager II spacecraft past the giant planets Jupiter, Saturn and Uranus. It then anticipates the passing of Neptune by the Voyager II and describes Pluto and points beyond as the next intriguing possibilities for exploration. The author not only analyzes and compares the characteristics of the giant planets, but details the technology and design capabilities of the Voyager II in an interesting and understandable manner.

Knowing that fine quality color photographs were available at the time of the book's printing, I found it somewhat disappointing that black and white photographs were used instead. I also note that the book is, of course, dated. Voyager II imaged Neptune in 1989.

Overall, I found this book to be fascinating chronology of the "Grand Tour" made by the Voyager II spacecraft. It captures the reader's attention as it informs and educates. The planetary information explained in the text provides a fine historical resource, as well as stimulating reading for the curious amateur astronomer.


Reviewed by Francine Jackson, University of Rhode Island Planetarium, Providence, Rhode Island, USA.

Although a book about a famous naval hero probably doesn't appear to fit into the astronomical niche, Captain Cook's life was surprisingly influenced by the heavens.

When he was a young sailor, Cook's first published work was his "Survey of Gaspe Bay an Harbour." This led to his surveying most of the St. Lawrence River, "... with the Harbours, bays and Islands in that river ... with all the Rocks, Shoals, and Soundings." So impressed were his superiors with his surveying skills that, when a leader was needed for a three-year excursion to map the newly discovered lands of the South Pacific and to obtain readings of the 1769 transit of Venus, James Cook was quickly raised to the rank of Captain and chosen to head the round-the-world journey.

"The morning of [the] 3 June 1769 [transit of Venus] dawnted crystal clear" wrote Cook, "as favorable to our purpose as we could wish ... If the observation is not well made, it is entirely owing to the observers." His six hours of Venus observing was deemed "as good as circumstancs allowed," even though his figures were not completely accurate (usually attributed to mechanical, not human, error). His survey of the South Pacific was precise, and his prevention of scurvy bordered on miraculous for that time. When a captain was need far another around-the-world excursion, Cook was the
natural choice. One of his tasks was to test the accuracy of a John Harrison-style marine clock against lunar positioning.

Author Hough portrays James Cook as a self-taught naturalist whose love of science showed itself in many ways, from the amazing maps he created (many of which have yet to be improved upon), to his observations of the heavens, to his pinpoint accuracy in global positioning, and to his negligible mortality rate among his crews. Although his third voyage, during which he is credited with the European discovery of the Hawaiian Islands, proved disastrous, Cook could be counted as one of the greatest sea-men to have ever lived. Anyone interested in 19th century seamanship and scientific practices, seen through the eyes of one who did both well, will truly enjoy this well-researched biography.


Reviewed by Wayne James, STARLAB consultant to East Central Illinois public schools, Mansfield, Illinois, USA.

"A picture is worth a thousand words?" We all know this, but how many words will an illustration replace? This series of library books for young readers (ages 5 to 9 years) depends on two very good foundations for communication: beautiful pictures and words by a well-known author. Both are trimmed to a minimum for young readers. The words are sparse, usually fewer than 100 page, yet challenging enough in vocabulary to keep the reader interested. The illustrations are very well done, so well that casual readers not familiar with the actual photographs found in most astronomy literature may not realize they are looking at drawings. Which brings me to the crux of any criticism of these books. How do you prepare material for the young reader? Patrick Moore is an old hand at choosing words to fit the audience, and these books are what you would expect from him.

What about pictures? Should we do the same for the younger reader? Trim the information to just the essence? Make the colors bolder? Take out a lot of detail that might confuse? Perhaps that was the intent of this series. Perhaps it is helpful to see an illustration that makes "the visually strengthened" among us say, "I could draw that well!" Perhaps it is less expensive to provide illustrations rather than actual photos.

As adults, we will enjoy looking at the series and comparing the illustrations with the photos we know so well. In an illustration of the full moon on p. 19 of The Sun and Moon I would include a photo for comparison, and an invitation for the reader to observe the Moon and try to draw what they see. All who try this with binoculars or at the eyepiece of a telescope will quickly discover for themselves just how visually skilled they are. This is a good way to appreciate the abilities of Paul Doherty!

Do illustrations lead to misconceptions? Yes, and so do photos, and so do words, and so do conversations! For we learn in chaos, kind of like the universe is created, not in logic or clockwork or even computerworks (whoops, running into PC problem again ...).

So go ahead and scan the series, get a copy for your local school, read them to your children or grandchildren, have them read to you (the pictures as well as the words), measure the sizes of the planets on pages 4 and 5 of The Planets, and see how your young ones understand the orbits on pages 8 and 9. Would you indeed see the two moons of Mars as shown on page 15? Why isn't Saturn shown in all the pretty colors like Voyager "saw" it? Why is the British flag shown on page 6 of Comets and Shooting Stars? (Who was taking the picture of Hillary on Everest? — a little politically correct social studies)

Does Betelgeuse have the color shown in the picture on page 13 of The Stars when you see it in binoculars? What else would you add to the drawing? Take your young readers out and see if they can see it in a telescope.

It's not the tools you have, but what you do with whatever tools are available. This series can lead to lots of learning, for the young reader as well as for the astronomer who wants to communicate new discoveries to the next generation.


Reviewed by Steve Tidy, Southend-on-Sea, England.

This is the sort of book you should show people who think that learning about science just can't be fun. Its author is well known to Americans as the writer and presenter of the TV programme Dr. Dad's PH3: Fantastical Physical Phenomena. Some of the simple experiments in this book have clearly been adapted from that programme, and great fun they are, too.

The presentational style and graphics indicate that the publisher has aimed it at "under tens." However, many of the physical phenomena readers are encouraged to mimic in the comfort of their own home can easily be adapted from science exhibits and planetarium-related studies for people much older. Tomecek's enthusiasm comes across clearly in the slick text. Like many of us these days, he is a converted hands-on teacher, and his credo is summed up in a quote from the book's Introduction: "The true beauty of science isn't just learning the facts, it's the process of figuring out why stuff happens."

Ain't that so.

The intrigued reader is gently introduced to the subject of light by studying how it reflects off different surfaces. By bouncing a ball off a wall at different angles, one can demonstrate regular and diffuse reflection. The text then journeys on smoothly through more complex ideas such as the theory behind concave and convex lenses, simple reflecting telescopes, finding the focal point, and so on. My favourite experiments were simulating a blue sky by shining a bright light through milky water, and creating a rainbow by shining the light on a partly submerged mirror. All very simple, but effective.

Last, but by no means least, perhaps the most innovative idea in the book is printing all the solutions to the many questions in a way that forces the reader to work out how to use a number of mirrors at certain angles to read the answers. Very nice!

I highly recommend this book. My only regret is that it wasn't around when I was at school.


Reviewed by Mark Rosauer, Buehler Planetarium, Broward Community College, Davie, Florida, USA.

The Universe Explained... is the first book by Colin Ronan that I have read. If this is a typical example of his work, I'll be sure to
look for some of his other titles. As a past president of the British Astronomical Association, his credentials are unquestionable. Ronan brings some of his expertise to this book. Written in a clear and concise manner, *Universe* succeeds as an introductory, coffee table book on general astronomy.

It has over 80 chapters, each of which is two pages long. These chapters are arranged in five general topics. The first four headings are set up like a typical Astronomy 101 text: Earth motions and astronomical history, planets and the solar system, the Sun and stars, and galaxies. The fifth topic deals with simple physics. Ronan has the notion that simple physics ranges from the four fundamental forces to cosmic wormholes and the anthropic principle. Despite the "heaviness" of the last few chapters, the author still manages to write about the subjects in a manner that an intelligent person can grasp.

The book itself is colorful with some high-quality graphics. Besides the obligatory star maps, the book also has a 3-D map of the constellation Orion. It has the first cross-section of the upper atmosphere of Jupiter (including the Great Red Spot) that I have come across. Other diagrams include a graphic of Earth's atmosphere that shows the relationship of altitude and the colors of the aurora.

The influence of computer software (Windows in particular) can be seen in the design of the book. At the far right margin of each chapter there are icons that give you the page numbers of related chapters. These icons are helpful, but small enough to allow the reader to ignore them without feeling that s/he is missing something by skipping over them.

The first edition is printed on acid-free paper. This insures that the page won't yellow and crumble in a few years. However, there are some mistakes that need to be corrected in later editions. The one that really sticks out is the chart of meteor showers. It states that the Perseid shower takes place from August 23 - July 30 with the peak on Aug. 12. A similar mistake occurs in his listing for the Delta Aquarids. These are the only major factual errors that I have found. There are other passages in the book which contain what could be typos or grammatical mistakes, or they could be accepted British usage and I'm just coming across these particular examples for the first time.

Overall, this is a very good book to supplement one's education. I can see using a soft-cover version as a secondary text in high school and college courses. It is also a very nice book to look at even if you already know the material. If it is ever offered as a text, I hope the publishers are smart enough to issue a slide set which uses and expands on some of the graphics.

---


Reviewed by Bob Ballou, Atlanta, Georgia

A title such as Choosing, Using, & Repairing Binoculars would seem to hold some excitement for any sky watcher hoping to make the next big discovery with just an ordinary pair of binoculars. Alas, though the title is promising, the book itself will be of little help to those who do their magnified watching through binoculars.

The trouble with this self-published, virtually unedited work is in the starting: the writing isn't good enough to elicit anything better than a feeling of annoyance from the reader. The abundance of misspelled words, quotation marks around single words, non sequiturs, and folksy sentences ("Sure, you look at a lens with a little dust on it and it just plain bothers you!") is a burden. There are a zillion exclamation points in this small volume. The old argument that those who write about science and its ancillary matters needn't necessarily worry about good writing is long dead.

A struggle notwithstanding, could a reader still make good use of Choosing to get that excellent binocular view of the firmament, or of the favorite rock star on the stage? Not quite. The organization of the text is uneven. Several paragraphs simply repeat what was said immediately above. Figures are low-budget though adequate, but captions are misleading and mislabeled. A glossary is included in the back, but a few important words in the text find no entry here. Collimation — the alignment of the optical axes of the lenses of binoculars to the machined mechanical components — gets a hefty, thoughtful treatment; however, the procedure is difficult to follow, requires a lot of time and grueling patience, and makes it clear that there is plenty of room for mistakes and worse vision.

Finally — and this seems odd — author J.W. Seyfried devotes a full chapter to himself ("A Brief Personal History" sandwiched between chapters on "Binocular Mathematics" and "Export Standards"), forging a simple bio somewhere in the back of the book.

There are some nice inclusions as appendices. In addition to the glossary, which is greatly appreciated, one finds binocular test charts, a decent bibliography, and a list of sources for equipment and a repair service (presumably in case the book doesn't sink in).

---


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

Despite an over-enthusiastic application of political correctness that is causing a decline in the number of Star of Bethlehem shows presented each December in public planetariums (at least in the United States), many institutions (and many members of the public) still enjoy hearing what astronauts have to say about that famous Star. Whether the Star was a real astronomical object or a later fabrication to add authenticity to the nativity, the fact remains the people have heard about the Star and expect astronomers, if not to explain it, to at least be able to say something intelligent about it. And there's always the possibility that a better understanding of the Star and the lunar eclipse that preceded it will help fix otherwise loose dates and nail down the history of this important but confusing period of time.

Ernest Martin is an original thinker whose passion is understanding the events surrounding the life and times of Jesus. His writings about the Star of Bethlehem have perhaps attracted the most public attention and comment, but his other books include an attempt to restore the original order of the books of the Bible and to identify of the site of the crucifixion. His fresh approach to historical problems and his willingness to reject the status quo if it does not make sense have put him at the forefront of those who are reinterpreting the history of Bible times.

The first edition of his new book appeared with the title *The Birth of Christ Recalculated* (©1978, and never reviewed in the *Planetarian*). It put together Dr. Martin's new chronology for the decade surrounding the death of Herod and the birth of Jesus. According to Dr. Martin, a critical reading of the events surrounding Herod's death suggested that Herod died several years later than had been

(Please see Book Reviews on page 50)
Ever since the discovery of ancient bones and the first use of the word “dinosaur” to describe the creatures they once were, people around the world have been fascinated by these prehistoric beasts.

Now, your audiences too can share the excitement and wonder at the diversity and magnificence of these beings who once dominated the earth as no other group of creatures has since.

Presented in a smoothly-flowing narrative style, “Dinosaurs!” takes your audience back for the feel of the time of the dinosaurs and explains how geologic time works in a method that is at once effective and easily understood.

By using fresh, new and exciting depictions of the dinosaurs themselves (more than twenty overall), this dynamic show answers the following questions:

- Exactly what were the dinosaurs?
- Were all creatures of that time dinosaurs?
- Are there any dinosaurs left?
- How big were they?
- Did they live all over the world?
- What did they eat?
- How did they die?
- How did we find out about them?

Best of all, this dramatic 30-minute show featuring more that 150 exciting slides is only:

$795.00 (Plus Shipping)  ORDER FROM:  JHE

Joe Hopkins Engineering • P.O. Box 14278 • Bradenton, FL 34280
Call 1-800-JHE-5960
Greetings!

Last November, NASA Administrator Dan Goldin visited our university campus at the invitation of one of our U.S. Senators, Conrad Burns. The purpose of the visit was to explore the possibilities of combining the complementary strengths of NASA, our university, and our community on several research and education projects.

Now I know that Montana is still perceived as being a bit, well—wild. We have wolves and grizzly bears and wide-open spaces and not many people and, as recent press reports in the U.S. media might suggest, a plentiful helping of bombers, gun-toting “freemen,” and goodness knows who else—all without a daytime speed limit on the highway. But contrary to some reports, we’re also civilized and educated (mostly), and people are often surprised by what they find in Bozeman: a respected and innovative science and education faculty, proficiency in telecommunications and outreach, a resource of small electronics, computer, and materials-development companies, an active regional museum and planetarium, and a remarkable number of NASA connections already. It was these things that Senator Burns hoped would impress Administrator Goldin and might create new avenues of cooperation.

And so we were all up with the chickens that Saturday morning last November to roll out the red carpet, for the long day of visits and meetings and luncheons was to begin at our museum with breakfast and an initial round of presentations. At the appointed hour the various entourages swept in, settled themselves around plates of eggs and muffins, and the slide shows began.

Several educators and science faculty proceeded to lay out their carefully crafted audiovisual presentations before Goldin and Burns and university administrators and their respective staffs: past accomplishments, available expertise, proposals for future joint projects in research and educational outreach. Dan Goldin is known for being an interactive listener, and not unpredictably, he halted the proceedings in the middle of one presentation to ask a question. And it was the Big One: yes, but what do you see as outcomes; what are the products you intend to produce, and how will you measure their effectiveness? Because this is what will be important.

The presenters fielded the question admirably, but I began, ever so slightly, to sweat. For there was something more than just talk on the agenda: there was, in fact, to be a product shown—in the form of a planetarium program.

Part of the museum’s role in the day’s activities was to present “The Final Frontier,” a planetarium program we produced in 1994 for the 25th anniversary of the first moon landing, supported by a grant from the NASA-funded Montana Space Grant Consortium. The show chronicled the history of the human desire to travel into space, in science fiction and fact, from the early dreamers to the Apollo program to future possibilities. It seemed to us an all-around good choice to demonstrate what the museum could do and suggest ways in which we could contribute to the educational proposals being discussed. It was a chance to show our stuff—not just to Goldin, but to Burns and our own university administrators. Would they find it a product worthy of the grand designs floating in the air that morning? A single bead of perspiration began to trickle down my back.

Then the presentations were over, and it was time for us. As our visitors made their way into the planetarium theater, the staff made a final unobserved check of systems and show setup. And when all were seated, I welcomed one and all to our make-shift universe, and pressed the green “Go” button. Computers spurred electrons into action, projectors stirred, the summer night sky dissolved into view overhead, and the mellifluous voice of John de Lancie (“Star Trek’s” Q”) floated out of the ether. And we were off and running, from the science fiction ramblings of Lucian to the rocket sketches of Tsiolkovsky to Buck Rogers and “Star Trek” to that “one small step” to a future base on Mars to the Star Child transforming into an astronaut before our eyes to the strains of “Thus Sprach.”

Our grizzly sacrifices the night before to the planetarium gremlins must have been sufficient, for the program performed flawlessly. And when it was done, Goldin turned in his seat and uttered a single word: “Outstanding!” The show was a hit—to the point that at a later luncheon address, Senator Burns remarked that “if you want to know why we should go into space, just go over to the museum and see their planetarium program.”

It was one of those compensating moments when the long nights and short budgets and frustrations and overwork and underpay suddenly seemed worthwhile. We offered a product that day. And it demonstrated, perhaps, to NASA officials and to politicians and to our own university researchers and educators what our museum, our planetarium, could add of value to the common effort. And if the discussions on that Saturday morning in November should one day bear fruit, perhaps we may find that we will have a role to play.

And if this sort of thing can happen in slightly-wild Montana, it can happen anywhere.

My point is that every day, every one of us has an opportunity to add something of value to our common effort to enlighten, to move, to motivate—to demonstrate our potential, to show that we can deliver when the product is what’s important. Our circumstances and opportunities may differ, but each of us can work with what we have to make a difference.

Granted, it’s not getting any easier. These days, many of us wonder—with good cause—what if any future the planetarium may have. I think of recent conversations with colleagues: the one who took a trip up the east coast of the U.S. and came back disheartened by the long lines at IMAX theaters and the much shorter lines at planetariums, the shrinking staffs, the slightly shabby look emerging around the edges. Or the colleague who sees large-format film as the future for his stand-alone facility. I ponder the closing of some planetariums, the decimated staffs of others; the struggle of facilities in Russia and the Ukraine, troubles in Germany which make our colleagues there wonder which way planetariums in their country are headed. I think of shrinking financial support for museums and similar facilities in general, reduced school budgets and their impact, increasing competition for leisure time and money.

It would be easy to be pessimistic. But then, where does that get us? What does it get us?

Late last year, I was asked to write an article on the future of planetariums for the January/February issue of Mercury, the Journal of the Astronomical Society of the Pacific. The issue was devoted to the future of astronomy, and featured articles from researchers, educators, and amateurs.

In preparing mine, I consulted a number of our colleagues to find out what they thought the future held. There were a spec-
of opinions, of course, but there were also common threads that seemed to emerge.

First, financial and institutional survival will be a challenge, and we must become our own best advocates. We need to be relevant to our audiences. We need to develop closer partnerships with other professional groups, institutions and communities to achieve our missions. We need to keep up with technology. And we need to diversify our portfolios, and be prepared to do a variety of programming and meet a variety of needs.

Of course, not everyone agrees, necessarily, and there are healthy debates about how best to achieve such goals. The Bill Gutschers, for example, say “now we’re getting the technology that can make the universe as exciting as it really is” and that we should use it. The George Reeds say that “technology will never replace the awe engendered by a view of the night sky,” and that we need to take advantage of our unique strengths in simulating this sky. Some say live interactive programming is the way to go; others say it’s multimedia star shows. And on and on and on.

And you know what? They’re all right.

The plain fact is that there is no one right way to be a planetarian, or a planetarium, or to contribute something of value to our communities, or to survive into the future. There will be many ways—almost as many ways as there are planetariums, for we exist in an incredible variety of circumstances. The key for us all will be to recognize our niche, and to fill it.

And it may matter less what resources or technology we have at our disposal than how effectively we use them. No one has everything, but everybody has something with which to work. The only real sin is in not using well what you have.

We haven’t chosen particularly easy or lucrative or secure careers. (But these days, who has?) And whoever coined that old Latin chestnut *ad astra per aspera*—”to the stars through difficulties”—knew what he or she was talking about. There are lots of days I’d like to change it to *ad astra per aspirin*. But then there are lots of rewarding moments, too, and reasons to fight the good fight, and opportunities to feel optimistic. Whether it’s the head of NASA offering a compliment or the sudden bright look on a little girl’s face that tells you she understands.

The future? Who knows? But let’s not miss the opportunities we have today, right now, to show our stuff, to make a difference, to contribute something of value to the causes we serve. It just might help to make our futures brighter than we might suppose.

**Officer Reports**

Please be sure to take note of the minutes from last October’s Council meeting provided by Secretary Lee Ann Hennig, and the 1995 financial report supplied by Treasurer Keith Johnson. Thanks to these officers for their efforts!

**Membership Survey**

Thanks also to Keith Johnson for compiling the data from the survey that accompanied this year’s membership renewal notice, and for preparing the report that appears in this issue. I think you’ll find it interesting reading, not only for the figures and numerical results but also for the diversity of opinions expressed in comments. The results will be of value to the Council in considering future directions and initiatives.

The tabulated figures for attendance and shows provide new estimates for world planetarium attendance which we hope will be useful to you. I’ve already had occasion to use the new numbers when writing an April visit to the Space Telescope Science Institute in Baltimore, Maryland to deliver a colloquium there.

Beforehand, I compared the IPS survey figures with those compiled by Mark Petersen of Loch Ness Productions and reported via Dome-L. And I found something interesting: when I grouped each set of numbers into similar dome-size categories, I found that with only a few exceptions, the larger of the two planetarium samples for a category produced the smaller average attendance. This gives some support to my suspicion that the numbers may overestimate a little through some sort of selection effect.

As a result, I took the smaller average for each dome-size category and came up with a total average figure of about 58 million planetarium visitors per year world-wide. Choosing to be even a bit more cautious, I characterized this figure as “more than 55 million visitors” for the purposes of my talk—which still delivered a total attendance figure estimate of more than one billion served since the first planetarium opened its doors at the Deutsches Museum in Munich, Germany, in the 1920s. Impressive figures indeed, even when one chooses to sit on the conservative side of them.

Again, I hope these estimates will serve you by providing statistics which illustrate the importance and effect of planetariums in the world today. In future years, we may be able to further refine these numbers through additional surveys.

**Hubble Materials**

For some months the officers have been working to establish avenues for IPS members to obtain good copies of slides, press releases, and information sheets from the Space Telescope Science Institute (STScI) and other sources. We realize that most of such material may already be available via the Internet, but we also realize that not everyone has access to this source, and not everyone who has access has the capability to convert images from cyberspace into good-quality slides.

In discussions with STScI, it became clear that the Institute did not have the capacity to add all IPS members to the mailing list to receive first-generation copies of Hubble images with accompanying information. But it was willing to add a reasonable number of names and addresses. We’ve therefore worked out an arrangement in which the name and address of a contact person for each IPS affiliate organization will be added to the STScI mailing list. This will assure that each affiliate will receive sets of information as they are released. Each affiliate can then determine how best to make the materials available to its members—through distribution of copies or by whatever means it finds most useful and helpful.

For now, the IPS affiliate representatives who sit on Council will be listed as the contact people. For more information, to offer suggestions on useful ways to distribute, or to learn more about your affiliate’s plans for this material, please contact your affiliate representatives or the officers/coordinates of your organization.

While recently in Baltimore, I also had an opportunity to talk to Educational Outreach Coordinator Anne Kinney about the possibility of working out a similar distribution method for public domain video sequences. STScI produces short videos of animations and Hubble images to accompany periodic presentations seen over the NASA Select satellite channel. Our initial discussions were promising, and I hope to be able to report in the future that such video materials will also be made available on a similar basis. The things I saw were wonderful and would prove very useful, I think.

We’re sincerely grateful to the Space Telescope Science Institute for their commitment to providing images, materials, and information to the planetarium community, to help spread the word and to teach good science to our public. STScI has proven to be one of the leading lights in this regard, and an excellent model which we hope other public research institutions will follow.

We’re also inquiring about similar sorts of arrangements with the Jet Propulsion Laboratory, specifically relating to the Galileo mission. Our efforts here are taking longer, so please bear with us—and look for future status reports on this initiative as well.
Magazine Subscription Discounts

I’ve also been in contact with the subscription departments of Sky & Telescope and Astronomy Magazines, to see if IPS qualifies for their magazine discount subscription program for astronomy groups (usually amateur astronomy clubs) in which group members can receive a savings on subscription renewals.

From the discussions I had, it appears that we do indeed qualify as an astronomy group eligible for these programs, and so we’ve decided to give it a try. A minimum number of subscriptions must be obtained in order for the program to go into effect. So if you have a subscription to either magazine, and you’re not already enrolled in such a program through your local astronomy club, and you’d like to take advantage of the savings, please contact Secretary Lee Ann Hennig with your subscription information. Once we have the minimum number of subscriptions in hand, the program should proceed, and the savings will be applied on your next renewal and will be handled through IPS and the IPS Secretary.

The discount is $10 U.S.—a one-third savings for U.S. subscriptions, and a one-quarter savings for subscriptions outside of the U.S.

If our effort here proves successful, this can be another potential benefit of IPS membership. Special thanks to Jeanne Bishop for the idea!

Outreach

ASTC: Last issue, I failed to mention our involvement in the meeting of the Association of Science and Technology Centers which was held last October in San Diego immediately following our Council meeting. A number of planetarians were in attendance, as were some of the Council.

The conference was hosted by the Reuben H. Fleet Space Theater and Science Center, and the theme was “Science Centers and Communities.” It was a large and fascinating conference, with an impressive display of exhibits, and no end of pertinent talks and sessions; there was much of value to be mined there by planetarians.

Many of us participated as presenters in the session entitled “A Universe for Everyone: Astronomy Showcase,” in which we offered examples of how planetariums and educational organizations around the world were reaching a variety of communities through the creative use of astronomy. It was a great experience and another effort to reach out and make connections with a group of professionals in much the same business as we are. Special thanks to Dennis Mammana for organizing and hosting the showcase.

IAU: There will be an International Astronomical Union Educational Colloquium sponsored by the IAU’s Commission 46 (Astronomy Education) to be held in London in early July. Bill Gutsch is our representative to this commission, but unfortunately the dates coincide with our own IPS conference in Osaka.

Nonetheless, we hope to have a presence there. Bill will be preparing a written statement on the world-wide efforts of planetariums which will be submitted to the colloquium organizers either for reading, inclusion in the colloquium materials, or inclusion in the proceedings. Undine Con­cannon of the London Planetarium will represent our interests there before she leaves for Osaka.

AAS: Information on planetarium meetings and events is now being sent periodical­ly to the American Astronomical Society’s newsletter for consideration by the editor. Special thanks to Alan Gould for providing this information as an offshoot of his “Planetarian’s Calendar” effort which appears regularly on Dome-L.

STScI: As I’ve mentioned above, I was invited in April to deliver a colloquium at the Space Telescope Science Institute in Baltimore, Maryland, on the topic of interac­tion between astronomers and planetarians. The colloquium had the slightly juicy title “Marriages Made in Heaven: The Astrono­mer-Planetarian Connection.”

I had an opportunity during the collo­quium to make use of our brand new attendance estimates, to review the efforts and effect of planetariums around the world, to review the outreach efforts in which we’re currently engaged and the connections we’re making with other groups and institutions, to promote the importance of increased communication and connection between astronomers and planetarians, and to stress the importance of planetarians as allies with a delivery system for supporting the work of astronomers and scientific investigation. More next time about this very positive experience.

Astronomy Link

One of the steps we’re taking in the direc­tion of astronomers springs from an idea that John Mosley expressed at last year’s ASP Educational Symposium in College Park, Maryland: to assemble a list of professional astronomers and others whom planetarians could consult concerning questions and matters on a variety of astronomical topics.

That effort is now proceeding under the working title of “Astronomy Link” through the Outreach Committee chaired by Martin Ratcliffe. We’re beginning to collect names and contact numbers with an eye toward publicizing the list probably in a future issue of the Planetarian. Our goal is to increase communication between researchers, academ­ics, and planetarians, and to help planetarians keep abreast of the latest thinking and research in astronomy and space science for presentation to our public. The Outreach Committee will monitor the project probably through periodic surveys to obtain feedback on the sorts of contacts being made, how much use the list is getting, and what the reactions and impressions are of both scientists and planetarians.

I’ve recently spoken to ASP President Bruce Carney about the prospect, and he’s indicated that ASP will take up the matter at its summer meeting, and expects that the project will find support there.

In the meantime, please consider asking your own local sources to participate in the project; you can send the names, affiliations, contact methods, and subject areas to Martin. We hope eventually to compile a substantial list of experts in a variety of sub­ject areas for the benefit of our membership. Special thanks to John Mosley for a great idea!

Assorted Notes

Australian conference: This spring I received a letter from Paul Floyd of Southern Star Education, Lot 25 Doncaster Drive, Beechmont QLD 4211 Australia, fax 07-55-333-610, e-mail s336167@student.uq.edu.au, about a conference being planned jointly by Southern Star Education (which offers mobile planetarium service to schools) and the Brisbane Astronomical Society, to be held in Brisbane next March 15.

The Southern Star Conference aims to promote astronomy and space science teaching in primary and secondary schools, and hopes to access resources from other countries with greater experience with hands-on education­al materials and useful techniques. The organ­izers are seeking speakers, sponsoring funds for speakers, educational material samples, and letters of support.

The organizers clearly not only wish to locate resources to help make their confer­ence successful, but also to impress local education department authorities—who, it is claimed, are not supportive of science teaching in the schools—with the importance of efforts such as theirs.

If you wish to help and can, you may wish to contact Mr. Floyd as given above.

Astronomy Day: Just before April 20—Astronomy Day (mentioned last time)—I received the new Astronomy Day Handbook of activities, published by the Astronomical League in conjunction with Sky Publishing
Corporation. Last October, Council agreed to be one of the international sponsors, and I'm pleased to report that our name appears in the new publication along with a distinguished list of 14 other organizations. Our museum planned a full day of activities in conjunction with our local astronomy club, the Southwest Montana Astronomical Society. I hope you also took advantage of the opportunity to introduce your public to astronomy in special ways. **IPS Home Page:** development of the IPS World Wide Web site is proceeding, and we expect that our preliminary effort will be up and running shortly if it is not already so. Council will be reviewing the home page during its meeting in Osaka. We hope you'll stop by the site, and offer your comments and suggestions to the Publications Committee and the Home Page Subcommittee. **IPS '96** As you read, the 1996 IPS conference in Osaka will be not far off; I hope to see many of you there for what will be a fascinating meeting and a chance to make contacts with colleagues from throughout the world. The agenda for the general business meeting will include the announcements of officer candidates for the year-end election and the selected site for the IPS conference in the year 2000, as well as brief affiliate reports. The Council meeting will also have a jam-packed agenda. Since the deadline for the September issue of this journal will descend just as I'm returning from Japan, look for news of the conference in the December issue. *Dewa mata—*see you there!

---

**Job Announcement**

**Planetarium Assistant (10-month position)**

The Schenectady Museum & Planetarium seeks a highly responsible, self-motivated individual who can take projects to completion with minimal supervision and who has at least two years proven planetarium experience. This individual must have the ability to present a substantial number of "live" planetarium programs (2-6 per day). This individual must also have experience in planetarium production and visual preparation techniques. Specifically, knowledge and experience with darkroom masking techniques as well as processing B&W and Kodakite is required. The individual will work a shifted week (e.g., Wednesday through Sunday). Starting date November 4, 1996. Salary (10 months): $13,140,000.

To apply, contact Richard Monda, Planetarium Director, The Schenectady Museum and Planetarium, Nott Terrace, Schenectady, New York, 12308; (518) 382-7890.
What's New

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

How about that comet?
When I was writing the previous column, it wasn't news yet. By the time you read this, it will be old news, and fading back into the firmament. But it was glorious while it lasted (and after a twenty-year drought, about time), and offered a wonderful opportunity to get people looking at the sky, find something beautiful there, and learn something about the universe in the bargain. Now if only Hale-Bopp, providing more warning, will do as well!

As we dust off our old comet shows and update them for the serendipitous Hyakutake and the approaching Hale-Bopp, we're reminded of the importance of taking advantage of opportunities that fall into our lap and that can involve and excite people about astronomy. Recently, another such avenue of engagement fell into my lap in the form of a review copy of a very fine computer program—this column's first item up for bids...

RedShift - The Next Generation
Astronomy-related computer programs continue to proliferate, and this is a good one. "RedShift 2" is a new and improved version of "RedShift," which seems to have won virtually every international award for a software product that there is—ten in all from 1993 to 1995. The new product has a number of new features, and it's a gas to play with.

The main program offers a view of the backyard sky and can plot 250,000 stars, asteroids, and comets, plus some 40,000 deep sky objects, positioning sun, moon, planets, and their moons for any point in time between 4,000 B.C. and A.D. 11,000. (Makes the universe seem downright crowded!) The sky can be manipulated in a variety of ways using a series of "control panels" which can add or subtract objects, basic grids, and constellation lines, lock onto objects, and let you zoom in on close-up views (of the planets, for instance) as if you had a telescope.

But that's not all. "RedShift 2" offers a series of ten "guided tours" which are narrated mini-programs a few minutes long using animations and other imagery to explain topics ranging from the Big Bang and galaxy and solar system formation to the cause of the seasons and finding your way around the sky. They're quite well-done, although I noticed that when running the tours, the program seemed to have to pause and catch its breath periodically and then continue; whether it's an intrinsic feature of the program or an effect of the computer we ran it on, I can't say.

There are also libraries of some of the latest space images and 20 short "movies" ranging from galactic encounter computer simulations to Apollo video footage from the moon. There is a dictionary of astronomical terms. There are surface maps of the moon, Venus and Mars which allow you to find large numbers of named features, plus a map of the earth on which you can center in on any number of locations. You can observe three-dimensional simulations of the planets from a variety of viewing angles. You can search time periods for planetary conjunctions and eclipses visible from your location, with accompanying displays. You can even look at little movies of the images and sequences you can create with the program.

One of the new features is "Space Flight," which allows you to follow selected spacecraft, satellite, and comet trajectories from a distance or hop on board to accompany them on their journeys through a full-color three-dimensional simulation of space. You can watch the earth drift past below you on board Mir, relive the flybys of the Voyagers, join Comet Shoemaker-Levy 9 (or one of its parts, at least) on its approach to Jupiter, or follow Galileo's more round-about odyssey to same. It's fascinating.

There's lots of treasure to be mined here, lots to experience and enjoy. The simulated images are quite well-done, the color photographs and video clips reproduce beautifully, and the animations are very impressive. It takes a bit of play to get the hang of the various controls and manipulate the sky readily, and sometimes the control panels get in the way of the imagery (they can be moved about), but it's all quite remarkable.

If I had a quibble, it would be that the star images (while nicely color-coded) are too much the same size to give a sense of the correct relative brightnesses of the stars; I found it virtually impossible at times to figure out what part of the sky I was looking at without activating the constellation line figures. There can be a down side to reproducing too many star images, as we all know from our planetariums.

Aside from that, I think it's a great program, at a good price ($54.95 U.S., according to the accompanying "software toys" catalog!), absolutely loaded with information and visualization—something definitely to consider for your gift shop shelf or for your arsenal of educational materials. The Maris people even threw in a musical CD called RedShift Suite: A Space Age Symphony by Jean-Pierre Garoton (a mix of electronic and mostly "mood" music plus some human recitation, appropriately spacey in feel).

According to the information received, the system requirements for running the program are for IBM and compatibles: 386SX or higher with hard drive (486 recommended), double speed CD-ROM drive, 256 color SVGA display (64K/16-bit color recommended), 8 megabyte RAM minimum with at least 2.5 megabytes free, Windows 3.1 and MS-DOS 3.3 or above, or Windows 95, a Windows-compatible sound card, and a mouse. Got it?

For Macintosh, you need: LCII or higher with hard drive, double speed CD-ROM drive, System 7.0 or above, 8 megabytes RAM minimum with 2.5 megabytes free, 13-inch color monitor or larger with thousands of colors recommended, QuickTime 2.0 or above, and again, a mouse.

For Power Macintosh, the requirements are: 6100 with System 7.1 or above, and all the other things you need for the Macintosh listed above. (For the purposes of our examination, we used a Power Mac 7200/75.)

If you are blessed with this kind of computer technology, or you have gift shop patrons who are, have a look. Contact Jeneane Harter, Vice President, Maris Multimedia, 100 Smith Ranch Road, Suite 301, San Rafael, California 94903 USA, telephone 415-492-2819, fax 415-492-2867. And enjoy.
 Paradigm Shift  

MIDI guitarist Mark Dwane is out with his fourth compact disc album of New Age-style music entitled Paradigm Shift, which I've recently had a chance to hear. It compares very favorably to his previous albums, mentioned in the March, 1995 column. Mark has a big, rich sound that continues to invoke ancient myths and possible futures with synthesized and layered melodies, catchy rhythms, and contemporary beats. The six selections average over five minutes apiece, bear titles like "Giza" and "Paragons of Light" and range from the atmospheric to the rollicking.

This is good stuff, and enjoyable to listen to. It's not background music, I think, but would work very well for seating and exit music (of course, get permission first), and would be a wonderful addition to your personal library. It can be had, along with Mark's other albums, for $17 U.S. apiece (add $5 for outside the U.S.). For inquiries or to order, contact Orbian Music, P.O. Box 45131, Westlake, Ohio 44145 USA. For credit card orders, the following telephone number may be used, at least in the U.S.: 1-800-767-4748. And online orders may be sent to http://www.Jochness.com.

Video CCD

I've received notice from John Cordiale and Jim Barot at Adirondack Video Astronomy, 35 Stephanie Lane, Queensbury, New York 12804 USA, telephone 518-793-9484 or 518-745-7520, e-mail 72323.3043@compuserve.com of a new line of ASTROVID CCD video cameras designed to be an "inexpensive alternative to conventional CCD imaging" and "extremely easy to use." No computer is required, and the information I received says these lightweight devices can be easily attached to telescopes and connected to monitors, VCR's and camcorders for recording brighter astronomical sights. They aren't suitable for deep-sky objects, but can record white-light sunspot details, lunar and planetary features.

Three models are available. The entry-level device, the ASTROVID 375, uses a 1/3-inch (8mm) CCD chip of 0.5 lux sensitivity with more than 400 lines of resolution in a 2-inch (50mm) by 1.75-inch (45mm) by 3.5-inch (90mm) body weighing just 6 ounces (170g), is readily attached to a camera with a C to T mount, and is good for the moon. The cost is $270 U.S. The intermediate level is the ASTROVID 400, a little larger and heavier and more sensitive and good for the moon and planets; it sells for $365. The "research grade" model is the ASTROVID 505E, which weighs 12 ounces (340g), has a 1/2-inch (12.5mm) CCD chip, a sensitivity of 0.1 lux, and a resolution of more than 600 lines. The literature indicates that it can record stars down to 9th magnitude through an 8-inch telescope. It costs $699.99.

Each camera comes with a power pack and 25 feet (7.5 meters) of cable. The company also sells 10-inch (25cm) and 12-inch (30.5cm) monitors for between $200 and $300.

It sounds like a relatively inexpensive way to get into CCD imaging for bright objects with modest telescopes. If you're interested, contact the company as given above for more details.

New Magazines

A couple of new magazines have crossed my desk in recent months. One of them is called Kids Universe, published by Third Millinium Publishing (that's the way they spell it), 2437 Bay Area Blvd., Suite 235, Houston, Texas 77058 USA, telephone 713-488-7671, fax 713-486-7743. As the title suggests, it's a children's magazine covering topics in science and the natural world. It's bright and colorful and the January/February issue I examined included games, activities, and articles on subjects ranging from animal behavior to meteorology.

The design suggests it's for perhaps mid-elementary levels, but the magazine uses a surprisingly sophisticated vocabulary. However, each of the big words and complex concepts is highlighted in boldface with an explanation in simpler terms in parenthesis after it. Which is good; while I can handle words like "buoyancy" and "vertebrate," even I might have to look up "positive reinforcement operant conditioning" and "sexually dimorphic." (I don't get out much.) It's an interesting way to introduce a lot of weighty words and concepts I wonder if it works.

I noticed right away that the issue didn't include any astronomy—pity. But I bet it will in the future.

I don't know what a subscription costs, but the issue had a $3.95 U.S. price listed on it. Nor is it clear how many times a year it comes out. If you'd like more information and perhaps a sample copy, you might contact the publisher as given above.

A second magazine I've seen recently is a newsletter-type called SETIQuest, which covers the world of the search for extraterrestrial intelligence. This one also uses a pretty impressive vocabulary—notably in the scholarly article "Detectability of Extraterrestrial Technological Activities," which discusses what deliberate or inadvertent signs we might find in each portion of the electromagnetic spectrum. Other articles in my sample issue discuss how SETI might be used as a way to encourage public awareness of science, offer an update on the message-carrying Pioneers and Voyagers, present book reviews, and summarize SETI-related items from a variety of magazines and articles.

If the topic interests you—as it does many—you can subscribe to SETIQuest for $25 U.S. per year. And the editors seem particularly interested in hearing from clubs and organizations, to whom they offer special rates. Inquire at SETIQuest, 174 Concord Street, Peterborough, New Hampshire 03458 USA, telephone 603-924-9631, fax 603-924-7408.

Extreme Ultraviolet Data

In late March, I received a notice from the Center for EUV Astrophysics (CEA), University of California, Berkeley, 2150 Kittredge Street #5030, Berkeley, California 94720 USA, telephone 510-642-3032, fax 510-643-5660, that the center is making data available from NASA's Extreme Ultraviolet Explorer (EUV) through a couple of research programs. The public Right Angle Program (RAP) provides researchers who make successful proposals with "an easy method for obtaining long-exposure scanner images and temporal data," the announcement reads. And the Guest Investigator (GI) Science Program provides registered researchers with "information, services, and instruction in the use of public EUVE imaging and spectroscopic data sets." Available archival data includes photometric data from the all-sky and deep surveys as well as spectroscopic and imaging data from pointed observations.

It sounds definitely research-oriented, but given that the word "public" is used, perhaps data might also be available to the likes of us for use in programs and classes. If you're interested in the extreme ultraviolet, it probably wouldn't hurt to ask. You might contact CEA above to find out, or seek more information via the EUVE Science Archive (http://www.cea.berkeley.edu/ or archive@cea.berkeley.edu).

ASP Catalog

The Astronomical Society of the Pacific catalog is out in its 1996 guise, brimming as ever with all sorts of books, posters, slide sets, software, videos, models and other items, and always there's something new. This time new entries include the "RedShift 2" software package mentioned earlier, and a poster of the stunning Hubble M16 image entitled "Pillars of Creation" selling for $9.95 U.S. For a copy of the catalog, contact the Astronomical Society of the Pacific, 390 Ashton Avenue, San Francisco, California 94112 USA.

(See please What's New on page 41)
A GIANT LEAP ... in laser display & presentations

Hardware • Software • Show-ware
Planetariums, Expos, World Fairs,
Theaters, Special Events, Theme Parks,
... and of course ...

LASERIUM®
6911 Hayvenhurst Ave.
Van Nuys, CA 91406 USA
818-997-6611
818-787-7952 FAX
http://www.laserium.com
The planetarium profession is going through its most difficult phase in 70 years of public service. Budget cutbacks and strong competition from television, video games and many other media are making life for planetarians increasingly difficult. What encouragement would you give to a young person just out of university who is considering entering the profession, but is put off by what they’ve heard?

It seems only appropriate that Tom Clarke, the most recent and visible sufferer at the hands of astronomy-ignorant administrators, is first off the mark with his thoughts about the current PR difficulties faced by the planetarium field.

As the sole remaining staff, at least temporarily, of perhaps the most visible planetarium cutback in recent memory, and one who is working on a renewal of the McLaughlin Planetarium hopefully to be completed within the next three years, I would question the premise that our problems are related to video games and other media. If the magic of astronomy and space manifests itself in games and other media, that is just evidence that the marketers still recognize that astronomy and space are highly marketable. That may be evidence of opportunity and a challenge to market ourselves in new ways. Rather, our problem may be that those who ultimately govern planetariums or make the choices that affect their operation, do not necessarily share our love and commitment to astronomy and science education.

What encouragement, then, might I offer? Well, since I always had more people approach me than would ever find a position, it is probably the same advice now as then and applicable in other fields as well. There is no one route to being a planetarian. (In fact, I have always argued, there is no planetarium profession, only people who work in planetariums. But that’s a debated for another day.) Young people should be encouraged to develop a variety of useful skills related to communicating, teaching, media production, and technology, and perhaps hone those skills outside the field until an opportunity becomes available.

The greatest encouragement I would offer is a strong belief that, whatever the problems our facilities may face, we can look to many people, not necessarily our administrators, who understand the value and importance of what we do. I have been encouraged, not just by the number of letter I have received, but by the thoughtful arguments they put forward in support of the planetarium. Here are but a few:

"It’s good to look up, and hold your daughter’s hand, and see her face full of wonder." Carole Corbeil - Toronto Star, November 18, 1995.

"The planetarium was a door to whole new worlds of outer space."

"The planetarium was a big part of my childhood memories - helped form my thoughts re immensity of the (sic) world. Children & adults need this."

"Not only is this a great learning experience, it’s so visually beautiful."

"One of the few places where individuals and families can have an experience that transcends the everyday world."

Tom Clarke
McLaughlin Planetarium
Royal Ontario Museum
Toronto, Ontario, Canada

A planetarium provides an environment that is second only to real life, an environment that surrounds you. Therefore, a planetarium gives something that no other media can. If you want to tell a group of persons something about kosmos, there is no place like the planetarium where you can start from the starry sky.

Large planetariums with staffs of many persons and other high costs have financial difficulties these days. The same applies also to many school planetariums, taking up space that the school board sees better use for. There are, however, planetariums that are quite low-cost in comparison with other planetariums and which do not occupy any space, except when in use: mobile planetariums. I foresee a good future for this versatile and popular educational tool, and I would recommend any young person who would like to work with planetariums to "get mobile". Some do it part-time as science teachers, others within a museum or science center, others as a private business. With the right person, any of these ways will do.

There are a number of possibilities on both sides of the Atlantic where you can get appropriate training. In Sweden, for example, Per Broman (per.broman@planetarium.se) runs a Mobile Planetarium Driver's License course every year in June. The 1996 course will be held 11-13 June.

Lars Broman
Director, Stella Nova Planetarium,
Falun Science Centre
Norra Jarnvagsgatan 2
S-791 33 Falun, Sweden

Rather than looking at the competition as a negative, I see it as having a positive effect on our industry. We, as professionals, have the opportunity and the mandate to allow our planetariums to grow and compete with these new technologies.

We are all faced with the challenge of keeping planetarium shows interesting and focused. Many people are interested in astronomy. Just look at the large number of people who show up for a comet or eclipse! It is our job to present astronomy in an exciting way, and motivate people to learn more.

New professionals must remain flexible. Major planetaria no longer have the luxury of large staffs. Nor can the new professional be expected to fill the role of musician, artist, technician and presenter. Tomorrow’s professional will need to be, educated, business-minded and have the ability to pull from non-traditional resources.

We must be realistic about one of the major challenges we face. We cannot expect a quickly-made, $2,000 planetarium show to satisfy audiences accustomed to high quality video games, the new breed of Hollywood special effects and multi-million dollar large format films. Only collaborative efforts will help us to compete effectively, fulfill our mission and deliver quality programs that will expand our audiences.

If I ever lose sight of what I am doing, all I
need to do is watch the face of a young child leaving the planetarium. There is no better motivation than seeing the excitement of a child learning!

Scott A. Niskach
Director of Theaters & Planetarium
Orlando Science Center
Orlando, Florida

For any college graduate, finding a job in a chosen field is difficult. There are few guarantees in any field; job security is a thing of the past.

In that respect, young people considering a career in the planetarium field face similar uncertainties to graduates interested in other fields. Given that, there are two main areas of encouragement I would give to a recent graduate considering a job in a planetarium. First, follow your dreams. If a career in a planetarium is what you desire, go for it. Don't settle for a career that may be more permanent, but less satisfying. If I were to lose my job tomorrow, I would be grateful for the opportunity; I wouldn't trade these ten years for anything. In my opinion, being a planetarian is a rewarding and unique occupation that has many benefits. Not only is it satisfying, being a planetarian fosters the broadening of knowledge and acquisition of expertise in many areas. Especially working in a small planetarium, there are a wide variety of skills attainable educator, astronomer, sound engineer, audio-visual guru, bookkeeper, publicist, computer programmer, administrator. Building on and refining these skills over your tenure will help you in the long run. Should you lose your job, you will be better equipped to find other work, whether in another planetarium or at another occupation.

Going out into the world with versatility is an asset; you can gain this in a planetarium and have fun while you're learning! Secondly, new blood in the planetarium field is positive. The competition planetariums face from television and video games is more easily addressed by a young person who has grown up with these media. If we are to compete effectively with such mediums, we must rise to the challenge offered by the new technology and fast pace of today's society. Having the perspective of young people who can breathe new life into the planetarium will help us address this issue. The freshness and spirit of youth, combined with the experience and wisdom of the established planetarians, might be the panacea needed to prevent further closures and layoffs; it certainly couldn't hurt.

Encouraging young people into our profession, and infecting them with our passion, will help ensure the future of planetariums.

Laura Deines Southworth Planetarium Portland, Maine,

Our planetarium is part of a public school system, one of the many built during the “space age” of the late sixties and early seventies. Since all of my experience is from the realm of public education, my advice will be to those who desire to enter the planetarium field as a teacher whose classroom happens to be a planetarium, rather than that of a “planetarium director” of a public museum or other facility.

First, Steve is correct that the planetarium teaching position is going through a difficult and competitive (for funds) stage. Money that might have been spent on astronomy and space education twenty-five years ago was spent on environmental education in the recent past and is today being exclusively spent on schools’ technology needs. It is my opinion that we need to be a willing and working partner with these interests, rather than be competing with them. For example, we recently added a weather satellite downlink to our planetarium to enable us to plan lessons on meteorology, as well as astronomy, for our student groups.

Here in the USA, education is largely a function of local and state governments who have embraced educational reform. In science, these reforms stress process and the development of scientific habits of mind, rather than a mastery of a large base of factual information. This would rule out entirely the “canned” or taped “show”, or any attempts at “lecturing in the dark” for planetarium teachers. Planetarium lessons need to be planned with attending teachers that encourage a great deal of student and attending teacher participation. For example, students might need to leave their seats, assemble in small groups — perhaps a lab station or table where they work on a task cooperative-ly, etc. The lesson should have an appropriate follow up for the classroom on the following day. To work in this manner one must have the cooperation of the attending teachers. These teachers must be willing to be involved in the planning and work that goes into the delivery of participatory lessons. Sometimes, we get calls from private schools or home teaching groups. Often, they will make a request such as this: “We have our important subjects in the morning, and we were looking for a field trip such as a planetarium show for the afternoon”. When I explain what would be involved in terms of planning for a lesson in our planetarium, they are often amazed that such planning would have to go into what they thought would be a passive “show”. If school groups want “shows” then they should just schedule a video or a movie.

There are many planetariums built in the last thirty years or so that are not being used at all, or not being used to their fullest extent today. Some, no doubt, are waiting for that eager university graduate who is ready to make the public planetarium a major partner in the education of the local student population.

Stu Chapman
Planetarium Director
Southampton School
Harford Co. Schools
Moores Mill Rd.
Bel Air, MD 21014

Things are tough in the profession. Museums are facing shortfalls and having to cut back programs. Schools don't enjoy the same kind of public goodwill they did in the 50s and 60s, and can't support science programs (in the U.S., anyway) as well without the threat of Communist superiority. And there are motion theaters and multimedia extravaganzas available to our children, that put most planetarium systems to shame.

So what else is new? Things are always changing. It reminds me of the situation in scientific research (especially astronomy) in the late 60s and 70s. With the U.S. triumph of the moon landing, the bottom dropped out of astronomy research. Jobs in astronomy dried up; one of my acquaintances from graduate school, one of the most talented and intelligent Ph.D.’s I saw come out of Steward Observatory, moved to Colorado and went into real estate because he couldn't get a job in astrophysics.

But look what's happened since. We've sent robot explorers to distant planets. We've launched a magical kaleidoscope above the clouds (and fixed it when a spherically-aberrated witch put a curse on it), and it's returned pictures that seem like paintings by the best space artists. We've found planets around other stars, and black holes in many places, and watched two dozen comets strike Jupiter.

Sure, we've done less than we could have. Certainly, the Hubble Space Telescope should have been the Hubble Large Space Telescope. There should be more than one space station in orbit. But wonderful things have happened, and I don't doubt they'll continue.

Sure, planetariums appear more precariously perched than they used to. But look what we can do now. With video, and all-sky projection systems, I can take my 3rd- graders
on trips through more of the universe than I could when I started in this crazy business. Yesterday I submerged myself in the ocean, and watched a whale shark swim by me, without getting even moist.

We can grab images of celestial objects out of the ether (or off a telephone line) to share with our students. Our classes can converse with scientists in distant lands, or even in space. We can plot orbits of newly-discovered comets faster than Isaac Newton, and we can use little electronic gizmos on our telescopes to bring them in closer than ever before.

There may be more (and different) problems in today's profession than back in the good old days. But there are more and different solutions as well, and some of them are pretty exciting. The old saw tells us: "If life hands you a lemon, make lemonade." I'd go further. I'd say: "Save the seeds, and plant an orchard!"

Keith Johnson  
Fleischmann Planetarium  
Reno, Nevada

My own view on this topic is that somebody new to the profession should not spend too much time thinking about the negative baggage which comes with the job; many of the problems are no different than in other more mainstream education posts the world over. Besides, I firmly believe that anyone with a genuine, deep love of the work (which most planetarians do have) will find this sustains them through the troughs.

Here is the next Forum topic:

**Sticking strictly to planetarium issues, if you could ask God one question, what would it be, and why?**

I'll be pleased to receive your contributions by July 13.

Have a good Summer/Winter, whatever may be your hemisphere bias.

Keith Johnson  
Fleischmann Planetarium  
Reno, Nevada

Finally ...

Since the deadline for the September issue of the Planetarian will be descending just as I'm winging back from Japan in July, look for news from the IPS '96 conference in Osaka in the December issue.

And so until next time—kawatta koto wa arimasen-ka ... what's new?

The Astronomical Society of the Pacific Annual Meeting will be held at the Westin Hotel in Santa Clara, California, from June 21 through June 26, 1996. It will feature sessions of interest to the general public, amateur astronomers of all levels, school teachers, college teachers, and research astronomers. For information, please phone: 415-337-1100 or e-mail lbaker@stars.sfsu.edu. The ASP web site is at http://www.physics.sfsu.edu/asp/asp.html.
**Planetarium Memories**

Kenneth E. Perkins  
6624 12th Avenue North  
St. Petersburg, Florida  
33710

**Circus Popcorn Sawdust**

Sounds of circus music could barely be heard as the girls from physical education classes walked toward the open door of the planetarium.

"Step right this way, La-a-a-die-e-s!" the mustachioed Barker droned.

"Get your free-e-e bag of popcorn! Step right this way...

Hardly did the girls recognize one of their very own classmates as the Barker costumed with mustache, the planetarium director's red lab jacket, bow tie and plastic straw hat.

Hardly did the girls recognize the planetarium decorated with a montage of colored lights on the dome, circus posters sprouting from the horizon line and sawdust and wood shavings scattered on the floor.

Twenty years ago at Smith Junior High School of the Vandalia-Butler City Schools, we did produce such a program in the planetarium. It wasn't a typical star show with an artificial sky and constellations. It was a special show for the girls physical education classes. The presentation used the planetarium as a special effects auditorium.

The show or presentation was built around a circus theme that began as the girls marched down the hallway and approached the planetarium. A Barker (a girl wearing a fancy jacket and mustache) stood out in the hallway hustling the girls inside as they were handed bags of popcorn. The carpet was strewn with sawdust and shavings to represent a circus tent. Circus music was belching out of the sound system. Circus posters stapled to pieces of cardboard bolted to furring strips anchored to the peripheral projection ring with obtuse angled 1/8 by 1 by 12 inch steel strap all obscured the planetarium horizon.

As the house lights dimmed, three large projected circles of red, blue and gold set the stage and became the rings of action. Into those three rings were projected action-stopping slides of girls' gymnastics. Balance beam, floor mat and parallel bars were the scenes of action. The gymnastic scenes had been photographed from books and magazines.

It was a fun show. It was an educational show. Hopefully, it was an inspiring show.

The teacher: Char Wiehe. Char was a student teacher working under the supervision of Jan Young. The show was her idea and together we joined the pieces.

There was a little bit of built-in concern about the removal of the sawdust, wood shavings and popcorn. No problem: A broom, shovel, dustpan and vacuum cleaner took care of the sawdust and shavings and there wasn't a grain of popcorn to be found.

**Runaway Balloons**

During a PTA Open House, the planetarium featured 11 minute mini-shows with six minute breaks.

As the second show audience trooped in, the lecturer's attention to the dome was prompted by, "Oh-Oh" and a giggle from the audience. Three hand held helium balloons were buoied to top center dome.

The show went on in the eyes and ears of the now hushed audience but in the back of the lecturer's mind was the question: How can those balloons be brought down?

During the first several seconds of the six minute break, the lecturer rushed to the science preparation room for a 14 inch length of glass tubing. Raced back to the planetarium workshop for a pair of diagonal pliers, three ordinary straight pins, three wooden matches and a pair of ordinary pliers.

The diagonals cut the heads from the pins and the matches. The ordinary pliers pushed the pins into the matchsticks and then pulled them out of the pins. The pins were turned around and the pliers shoved the pins into the matchsticks again resulting in three impromptu darts.

Using the glass tubing as a blowgun, with a little over a minute to go, the darts were launched toward the suspended trio of balloons.

"Pop." One of the balloons and dart dropped to the pedestal. "Pop."

Number two balloon and dart dropped to the pedestal. "Pop." Number three balloon dropped; however, no dart.

Dart number three was stuck in the acoustical plaster dome but the next mini-show opened without a gasp other than for the starfield.

Epilogue: Dart number three was removed later by two bamboo fishing poles lashed together with masking tape and tipped with some of the tape sticky-side out the same way that the undimmable spider was removed at an earlier time (Planetarian, circa 1973)

**Dog Flea Story**

Talk about other planets surrounding other sun-like stars reminds me of a story that I would share with my students.

"Could there be planets around other stars?" a student would ask.

"Likely, since most dogs have fleas."

"Why can't we see them?"

"We do well to see the dog and we do well to see the stars." Adding, "Do you ride the school bus?"

"No. Then some afternoon let's meet on the front lawn as the busses are leaving and hopefully we will see the neighborhood dog and a friend on a bicycle."

A day or so later, we were on the front lawn, looking down the street toward the gas station on the corner.

"There it is—the neighborhood dog. It's right in front of the gas station."

"Yes, I see it."

"I'll bet it has fleas."

"How can you tell from here?"

About that time, the friend on bicycle rides up.

"Are you going down toward the corner?"

"Yes, why?"

"When you get down there, entertain the dog there in front of the gas station until we get there?"

"What for? Okay, never mind, but hurry."

The friend hurries away on the bicycle and we follow on foot—in a hurry. As we arrive, the friend is scratching the dog and saying nice things to it.

As we join in scratching the dog and looking very closely, a flea is found.

"How could you tell that this dog had fleas?"

"Most dogs have fleas but we could do well just to see the dog."

Our sun has planets. Likely other stars have planets but we do well just to see the stars.

☆
Most Frequently Asked Questions:

**QUESTION:** What is the most frequently asked question about 'STAR HUSTLER'?

**ANSWER:** That's easy. Everybody asks about our theme song which is the classic 'Arabesque #1' by Claude Debussy performed by Tomita on the still available "Snowflakes Are Dancing" album (RCA).

**QUESTION:** At what times and days of the week can I see 'STAR HUSTLER'?

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

**QUESTION:** If I can't find 'STAR HUSTLER' on my hometown PBS station, how can I see it where I live?

**ANSWER:** 'STAR HUSTLER' is provided free of charge by WPBT, Miami to all PBS stations. If you can't find it, write or call your local PBS station and ask if they will air it and remind them that it is available free of charge.

**QUESTION:** Is it necessary to get special permission to use 'STAR HUSTLER' for astronomy club meetings, teaching in the classroom, science museum or planetarium use?

**ANSWER:** No. In fact, many astronomy clubs, teachers, science museums and planetariums have been taping 'STAR HUSTLER' off the air and using it regularly as a way to reach their public.

**QUESTION:** Is there any way I can get 'STAR HUSTLER' other than my local PBS station?

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

**QUESTION:** I am a teacher planning my curriculum and would like several 'STAR HUSTLER' episodes in advance, but I do not have access to a satellite dish. Is there any other way I can obtain 'STAR HUSTLER'?

**ANSWER:** Any teacher anywhere around the world can obtain 'STAR HUSTLER' episodes in advance through their NASA C.O.R.E. Teachers' Resource Center. For details write: NASA C.O.R.E.; Lorain County Joint Vocational School; 15181 Route 58 South; Oberlin, OH. 44074.

**QUESTION:** Why does 'STAR HUSTLER' always say "Keep Looking Up!" at the end of each show?

**ANSWER:** Have you ever tried star gazing looking down?
I hope everyone is having a great summer! As I am writing this in April, I don't know how warm it will go yet. I was just married in Fort Worth on March 30th to Martin Shupla—a television news reporter. We had a great honeymoon in Italy! Thanks to everyone's well-wishes.

Congratulations

to Mike Lutz (Laser Fantasy Int.) and his wife Barb, who were expecting little Lutz #2 on May 1st.

to Prue Campbell (formerly of West Chester State University) for her new position as Special Projects Education Coordinator at the Space Telescope Science Institute in Baltimore.

to Kevin Lane-Cummings (Willard W. Smith Planetarium, Pacific Science Center in Seattle), for receiving a 1995-1997 International Partnership Among Museums award by the American Association of Museums to undertake an exchange with the Hong Kong Space Museum. It includes a 4-week trip to Hong Kong for Kevin in June, and the joint development of a complete astronomy program that he will present to Hong Kong students. Similarly, Robert Leung (Assistant Curator in School Programme at the Hong Kong Space Museum) will spend 4 weeks in Seattle with the local students.

to Bow Walker (Hudnall Planetarium, Tyler Texas) on the birth of his baby boy! (With so many children being born, it's hard to remember if I've mentioned it before.)

to Jon Bell (Indian River Community College, Fort Pierce Florida) for receiving the 1996 Instructional Innovation Award, for "his creativity and vision in developing and implementing the educational programs of Halstrom Planetarium. In 1995, Jon received the Ambassador Award as the faculty member who best exemplifies the role of ambassador for the college. He's been doing a lot of community service and public speaking. By the way, additional late congratulations to Jon and his wife Lisa on the birth of their son, Daniel James Bell, who was born on November 2nd, 1995. Jon said that newborn Daniel seemed to say "alright—I know somebody ordered pizza—where's my slice?"

you Donna Pierce (Highland Park Ind. Sch. Dist., Dallas Texas) for bringing her girls' golf teams to internationals; she said they're planning on getting to the state competitions. Good luck!

Our Condolences:

John Williams (University of Arkansas at Little Rock) is seriously ill with cancer. At this date, the family would prefer no phone calls. Perhaps cards or letters would be in order—please check on his condition before writing them.

Did You Know ...

Murdock Sky Theater (at the Oregon Museum of Science & Industry) is reopening May 24th with a revised version of their popular show, Orion Rendezvous. They've been closed since February from flood damage. Unfortunately, their staffing was also cut months ago; Jim Todd has been running the planetarium single-handedly ever since.

The European Planetarium Network (EuroPlanet) is really taking off—kudos to Thomas Kraupe (Forum der Technik Planetarium, Munich) for all of his efforts! Their web page is fantastic, with a huge number of web links. Kudos also to Webmaster Dr. Klaus Woelke (also from Forum der Technik Planetarium, Munich) Speaking of web pages, the IPS web site is beginning to fit together, and something should be ready to show the Council members by July.

It's finally happened. Howard Estes (Spitz, Inc. ever-popular technician) finally retired. I guess all of the planetarians down in the Dallas-Ft. Worth metro area will finally have to grow accustomed to someone else. Speaking of Dallas, the Science Place will have their new 15 perforated 70mm theater opening in June. Ask John Cotton, Wilgus Burton, Paul Hoehn, or the Irbys (The Science Place Planetarium, Dallas Texas) how it's going next time you see them—maybe in Japan?

Taylor Planetarium at Bozeman, Montana, was visited last November by NASA Administrator Dan Goldin. Jim Manning reports that they showed him their production "Final Frontier" on the anniversary of the lunar landings; Mr. Goldin "loved it!"

John Hare (Ash Enterprises) is not at Bishop Planetarium any more; he's devoting his extra energies into his company. George Fleenor (Bishop Planetarium, Bradenton Florida) is the new Acting Director. Holly Smetzer (formerly of Bloomsburg University) is now at Raritan Valley Community College (Somerville, New Jersey) as an instructional designer.

Carole Helper (Mark Smith Planetarium, Macon Georgia) reports that their facility finally has indoor, easily accessible rest-rooms. That should come as a bonus for the next time they host a SEPA conference! Barbara Baber (Morgan Jones Planetarium, Abilene, Texas) was house-hunting for a place for herself and her dad; reportedly, she's found a place with the bedrooms on opposite sides of the house.

Most planetariums that held observing sessions for Comet Hyakutake undoubtedly had great turnouts—maybe we should rename 1996 "the Year of the Comet!"

Richard Monda (Scheneectady Museum & Planetarium, Schenectady, NY) reports that their session on March 29th had 300 people in attendance; they even had to add extra planetarium shows! Schenectady has also begun a search for a Planetarium Assistant; interested individuals should contact them for a job description (see page 35).

Rob Landis (Space Telescope Science Institute) and Richard Picko (Ward Beecher Planetarium, Youngstown Ohio) went to Russia last April. Rob made presentations on the HST and gave his counterparts an update on NASA's initiatives to create science institutes. Richard gave details on how planetaria play a role in science/astronomy education. Rob said that the trip was an amazing experience, "I love our new found friends over there dearly. It's unfortunate that the political realities of yesterday didn't permit such exchanges like this to occur earlier. If they had, the world would be a different place today."

Rob Landis has been busy. He and Martin Ratcliffe (Henry Buhl Jr. Planetarium, Pittsburgh, Pennsylvania) have been flying to London to work on a series on "The New Solar System" for cable television. He also did an open house for Jon Bell (Hallstrom Planetarium) at which he presented two lectures to over 500 people. Jon's planetarium was finally given a name! Finally, Rob was our Guest Speaker for Astronomy Day here at the Don Harrington Discovery Center. His lectures so fascinated his audiences here that we had trouble tearing him away from them afterwards.

Speaking of Astronomy Day, Kevin Lane-Cummings (Pacific Science Center, Seattle, Washington) held a contest to find the "planets" for Astronomy Week. They formed a scale model of the solar system (the scale was 1 to 180,000,000), with a 7.8 meter-wide
sun at the Pacific Science Center and a 1.3 cm Pluto located 42 kilometers away. Some of the possible sites for the planets included the Space Needle, Microsoft, and a television station.

Donna Pierce said I just had to include a copy of the poem I wrote for my wedding invitations in this column:

I called to the heavens and awaited reply but the only echo returned was my sigh.

I still watch the stars but now as I stand I rejoice in the view while holding his hand.

Have a great summer/winter/July!☆

(Questionnaire, Table 3, continued from page 12)

Conference costs have gone too high for me to attend, even in U.S. Only benefits I use now are Directory and Planetarian. I will continue membership for a while, but will focus more on my regional association and other users groups, which are more directly tied to the work I do.

All our shows are mastered onto 3/4" video w/ visuals synched to audio; extra video from laserdisc. Curious if other planetariums are doing something like this.

Unless you folks provide this dupe service IPS has very little importance besides the Planetarian, with 6 years before the next IPS [sic] on this [sic] continent!!! Why bother to join?

Everything helps.

Don't know what you're leading up to, but it sounds great!

It would be nice to get a little something more than just a directory and books for membership.

As to what, I'm unsure to suggest depending on cost.

Why are you conducting this survey?

Please place next IPS conf. somewhere in USA or Europe.

(Would like...?) databases for videoclips (with quality rating), computer programs for presentation in planetariums (no windows...) (sic)

Looking forward to new edition of "SFX Sourcebook"

A very big thank you to IPS. I am the only astronomer/planetarian (here) and I greatly value the help and support I get from colleagues at other planetaria.

(Long response. Basically, would like IPS to supply low-cost shows, show materials.)

Any service that would reduce the business that the scuzzy company called (bleep) gets would gladden my heart.

An IPS Web page would surely generate new members and raise our profile.

Go for it!

Vol. 25, No. 2, June 1996

Planetarian
SN 88° II PLANETARIUM, AN INFINITY OF POSSIBILITIES PLUS ...YOUR SKILL!

Based on its experience as automation specialist, RS Automation offers an innovating planetarium concept: the SN 88°II. The ease with which the most advanced functions are used will allow you to show existing productions or create your own with minimum difficulty. Amongst other advantages, you shall appreciate in particular:

Centralized piloting: all productions tools (planetary device, diascopes, video projectors, surround effect sound and lighting...) are operated by one powerful calculator, using a specific program, the Integral software. All can thus be controlled, automatically or manually, from the console.

Speed and flexibility: in only a few seconds, you can pass from an observation point and an observation date, to other coordinates, even to those located in totally different periods or regions, and this even from another planet. You just enter the coordinates and the calculator repositions itself immediately, silently and with maximum precision.

User-friendliness: no need to be a computer specialist to operate this system which uses a PC compatible computer as interface between the user and the calculator, associated to the Integral software developed on Windows. You can therefore develop your own productions, simply using the trackball, the action menus and configuring the timing for each tool. You may also purchase existing productions, which are easy to implement, develop or modify.

RS Automation manufactures planetariums from 9 to 15 meters diameter, horizontal or inclined, and will, following your request, undertake overall implementation of a complete planetarium (including a spherical screen, floor and wall covering, seats, electricity, air conditioning...). Specific developments are also possible, such as planetary device elevating systems associated to a trap-door mechanism allowing use of the room for other purposes.
It's tough working on stuff when you don't have the right tools. Anyone who's ever tried doing electronics work without a soldering iron can verify the truth in that statement. One of the biggest problems the typical special effects tinkerer encounters, I think, is not having the facilities to fabricate workshop.

As effects builders—or would-be effects builders, at any rate—we fidget a lot with motors and the mechanisms driven by them. The fundamental use of planetarium special effects is to add dynamism to visuals, and there's no more basic way to do that than through the use of a motor moving something. For instance, in building special effects, I regularly find myself in need of shaft couplings, for attaching a motor to a shaft in a special effect mechanism. Take the basic slew mirror. Let's say we have a front-surface mirror about 15cm (6 inches) square and need to turn it with a motor. Because of the size and weight of the mirror, it's advisable to attach the mirror itself (via epoxy, or some other method) to a shaft which is, in turn, suspended between the drive motor and a stationary upright support (Figure 1).

The uprights for the motor and the mirror shaft are pretty easy to construct from aluminum bar and angle stock using a hacksaw, a small bench vise, and a hand drill or drill press. To round-out the slew-mirror mechanism, though, we also require some way of attaching the motor shaft at one end, and the mirror shaft at the other.

It's when you realize that unless the two bores are perfectly aligned—therefore maintaining a perfect alignment between motor shaft, mirror shaft, and the bore or bushing in the mirror shaft's upright support—the entire mechanism will bind up and stall as it rotates. And if you've ever tried making such a part without highly-specialized machinist's tools, you know just what an impossible task it is—seemingly, anyway.

Actually the coupling would be a cinch to make if we had a machine lathe (Figure 3). The main components of a machine lathe are the motorized headstock assembly (which holds and rotates the metal stock), the tailstock (which can be set up to have either a centering support for long metal stock, or a drill chuck, or other tools), the toolrest assembly (for positioning tools for cutting metal from the outer perimeter of the turning metal stock), and a grooved bed (along which the toolrest and tailstock assemblies can be positioned—all the while maintaining alignment with the headstock assembly). Often especially when working with cylindrical stock—a large chuck, which is roughly similar in function to a drill chuck, is screwed onto the headstock assembly. Unlike with a drill or drill press, however, the lathe's cutting instruments do not rotate but remain stationary and the metal stock spins. Metal lathes are extremely versatile pieces of equipment that can facilitate many different metal-working procedures including turning (cutting) cylinders and conical shafts, boring holes of a wide size variety in all sorts of metal-stock shapes, and thread-cutting on both the outside of a cylinder and the inside of a bore. With a lathe, all we'd need is to chuck a short piece of small-diameter cylindrical aluminum stock in the headstock chuck, install a drill chuck in the tailstock and a drill bit in the drill chuck, drill each end of the aluminum stock for the appropriate hole size, and we'd have a perfectly aligned coupling (minus side-drilled and tapped set-screw holes, which would be made after) within a couple of minutes.

But that's where life starts to get much more complicated. Actually, making a coupling to attach the motor shaft at one end, and the mirror shaft at the other sounds easy enough. It's when you realize that unless the two bores are perfectly aligned—therefore maintaining a perfect alignment between motor shaft, mirror shaft, and the bore or bushing in the mirror shaft's upright support—the entire mechanism will bind up and stall as it rotates. And if you've ever tried making such a part without highly-specialized machinist's tools, you know just what an impossible task it is—seemingly, anyway.

Actually the coupling would be a cinch to make if we had a machine lathe (Figure 3). The main components of a machine lathe are the motorized headstock assembly (which holds and rotates the metal stock), the tailstock (which can be set up to have either a centering support for long metal stock, or a drill chuck, or other tools), the toolrest assembly (for positioning tools for cutting metal from the outer perimeter of the turning metal stock), and a grooved bed (along which the toolrest and tailstock assemblies can be positioned—all the while maintaining alignment with the headstock assembly). Often especially when working with cylindrical stock—a large chuck, which is roughly similar in function to a drill chuck, is screwed onto the headstock assembly. Unlike with a drill or drill press, however, the lathe's cutting instruments do not rotate but remain stationary and the metal stock spins. Metal lathes are extremely versatile pieces of equipment that can facilitate many different metal-working procedures including turning (cutting) cylinders and conical shafts, boring holes of a wide size variety in all sorts of metal-stock shapes, and thread-cutting on both the outside of a cylinder and the inside of a bore. With a lathe, all we'd need is to chuck a short piece of small-diameter cylindrical aluminum stock in the headstock chuck, install a drill chuck in the tailstock and a drill bit in the drill chuck, drill each end of the aluminum stock for the appropriate hole size, and we'd have a perfectly aligned coupling (minus side-drilled and tapped set-screw holes, which would be made after) within a couple of minutes.

Unfortunately, metal lathes are not cheap. In the U.S., for instance, they typically run in the thousands of dollars. (In fact, the lathe we use at Morehead was acquired as a used

In this installment, we'll explore some strategies for making an essential and oft-needed bit of effects hardware—the motor-shaft coupling—without having a master-machinist's workshop.

Richard McColman
Morehead Planetarium
CB #3480 Morehead Bldg.
University of North Carolina
Chapel Hill, North Carolina
27599, USA
ing or cutting job you can dream up.

Of course, this "wait on the lathe" approach doesn't help us with our current dilemma of fabricating a motor-shaft coupling for our slew mirror. But as I said earlier, we're going to explore an alternative, less equipment-intensive strategy for that. In fact, as long as you have a few basic power and hand tools—including a small-to-medium-sized drill press (Figure 4)—you can center-drill round metal stock which is functionally just as good as can be done with a lathe.

Note that I specified having a drill press, rather than a simple hand drill. First, the following procedure cannot be accomplished without the "relational geometry" afforded by the drill press. By having a rigid and unchanging axis of rotation of the drill chuck, as well as an equally rigid and unchanging stage for positioning the work—perpendicular to the chuck's rotational axis—the alignment of the coupling's shaft bores can be established and controlled. Second, a drill press should be considered basic equipment for the planetarium because it has the versatility and stability needed for many other drilling jobs. (Of course, a handheld drill is also a necessity for jobs where portability is required, but it cannot provide the relational geometry between stock and cutting tool—in this case, the drill bit—that the drill press can.) Third, smaller drill presses are actually rather inexpensive, as large machine tools go. If you don't have one already, consider it a "must" purchase for your planetarium, even if you're not a mechanical whiz. A decent, medium-sized unit can be had at home-improvement stores for less than $300 in the U.S., and such a tool will last you for many years. Given its easy-of-use, you'll be glad you purchased one whenever you have special effects or other fabrication projects to do. If you can, buy a unit with at least a 13mm (1/2 inch) capacity drill chuck. This will allow you to use larger-size bits as well as decent-sized metal dowel stock for making couplings, etc. (There are only two caveats to remember here. First, note that many of the home-improvement-store models include drill chucks manufactured with substandard forging. In other words, while the chuck will function just fine initially, you may find that it will start to wear out after two or three years of regular use. In such a case, simply be prepared to replace the chuck with a better-quality one when the time comes, or go ahead and spend a little more up-front to get a press with a better-quality chuck. Also, avoid the temptation to buy one of those little "drill press stands", designed so that you can install a hand drill on it. While these devices work fine as a stop-gap drill press for those crunch-time "in the field" jobs, they won't provide the stability or accurate geometry needed for more critical work. And they are often more of a hassle than a help when doing anything more that just an occasional drill-hole.)

A few other tools that will be needed for fabricating center-drilled shafts and couplings—tools that any well-equipped planetarium should have, anyway—are a bench vise, a hack saw, drill bits, machine taps, a center punch and an assortment of metal-cutting files. In addition, you should have a good-quality drill-press vice, and a prismatic jaw (Figure 5). This last item is an accessory for the drill-press vice, and essentially is a block of steel with one horizontal V-groove and one-to-three vertical V-grooves. When placed in the drill-press vise between the standard flat-faced jaws, the prismatic jaw will tightly hold a piece of cylindrical stock—such as tubing or dowel—and keep it either horizontally or vertically oriented for drilling. (Some drill-press vises even come
with an integral prismatic jaw.) Finally, you should get a small machinist's countersink (Figure 6). Also known as a center drill, this special bit can be used to drill a conical countersink hole for the use of flat-head screws. On a lathe, though, it is designed for drilling a shallow conical depression in the end of cylindrical stock and "finds" the center of the cylinder. This cannot be done accurately with conventional measure-and-mark methods. Nor can it be done effectively on a lathe with a standard high-speed metal drill bit, as the tips of such longer bits tend to flex as they catch the slight surface irregularities in the stock's end-surface and, as a result, wobble and orbit around the true center, as in Figure 7 (depicted set up on a lathe). The much squatter length of the countersink makes it relatively impervious to the forces that flex the standard metal drill bit (Figure 8).

Basically all that remains is to get the metal stock. Once you have it and all your tools, fabricating the shaft-coupling is fairly straightforward. Most of the time, I simply use 13mm (1/2-inch) diameter round solid aluminum stock from the local hardware store, since it's easy to find. However, this really isn't the ideal grade of aluminum for machining since it tends to be a bit on the soft side. But as long as you use plenty of cutting oil when drilling and tapping, this material works fine. On the other hand, if you can get a harder grade of aluminum formulated specifically for machining, so much the better.

The first step in coupling-fabrication is to cut a short length of the round aluminum dowel stock—I generally cut about 25mm (1-inch) when making mine. After tightening the dowel in the drill-press chuck, it's important to make the end of the stock as symmetrical as possible. Actually, if we were using a lathe at this point we'd "turn" the end to a flat shape using a "face cut". But since we aren't using a lathe here, we must do the next best thing and run a flat file across the bottom end of the chucked aluminum dowel as it spins in the drill press. Since the dowel spins clockwise in the drill press as seen from overhead, the file should be pushed forward while bearing it toward the right-hand side of the dowel's bottom end in order to maximize the proper cutting action (Figure 9). Filing the stock in this manner should eventually leave you with an end which—while not perfectly flat—should be essentially symmetrical (typically a slight dome shape). While this is an unorthodox method of machining aluminum, it is nonetheless effective in minimizing the surface irregularities at the dowel's end. This operation will prove necessary as we later attempt the center-drilling procedure. (By the way, the filing will go faster if you start with a coarse-cut file and move down to a fine-cut file to finish.)

Once you've determined that the dowel's end is symmetrical—with no remnants of the hacksaw-cut irregularities, it's time to "find the center" of the stock. But first make sure that the drill-press stage is perpendicular to the spin-axis of the drill chuck by checking the degree-scale on the stage's tilt-axis and adjust the tilt if necessary. Now, place the drill-press vise on the press' work stage and with the prismatic jaw insert-
(using cutting oil to keep the bit cool). After that's done, simply repeat the entire process on the opposite end of the aluminum dowel—using the appropriate-diameter bit for the other shaft.

Now, all that remains is to side-drill and tap holes for set-screws in the dowel. The prismatic jaw will help you here as well, as you can use its horizontal groove to hold the dowel in the proper position for side-drilling. First, tighten the dowel in the jaw and vise with about 1/3 of it protruding out the side of the vise, and use your center punch and a hammer to impress a starter dimple where you want to start drilling. Now, select a drill bit that corresponds to the screw-tap you'll be using, tighten that into the drill press' chuck, and drill through to the center-bore place. For American-standard screws, machinists precisely match numbered wire-gage bits to their taps. While these can be acquired in sets of 60, the better hardware stores sell these bits individually, so you don't have to purchase a full set if you're only drilling a few specific sizes. Typically, the required drill-bit size will be stamped into the tap's shank, serving as a guide for the drill size to buy. Also, make sure to apply cutting oil to the tap and hole before tapping. And be careful when actually tapping, as the tap should be aligned with the drill-hole and firmly torqued—but not overly—so as it is run into the screw-hole. To get the tap to start cutting threads, you will probably need to apply some initial downward pressure on the tap handle in addition to rotational motion. Once the tap begins to "take" you can then relax the downward pressure.

Don't expect that you'll be able to screw the tap into the bore with one continuous motion. Hand taps generally have three or four narrow longitudinal grooves into which the metal chips collect. As a result, the chips can quickly "pack up" inside these grooves, making it difficult to continue twisting the tap in. The solution is to use alternate twisting motions as you tap the hole. I usually twist the tap in a full-turn clockwise, then back out a half-turn counterclockwise, followed by a full-turn clockwise, and so on, which keeps the freshly-cut metal chips from binding up the tap as the tap progressively advances into the hole. Eventually, however, as the tap-grooves fill up with metal chips, you'll probably need to back the tap out of the hole completely, clean the tap with an old toothbrush, and resume the tapping again to finish. Be sure to be sensitive to any extra resistance or binding of the tap during the procedure, as this is a sign that the tap-grooves are packing up. Failure to recognize this can lead to poorly-cut threads, or worse, a tap broken-off in your work—an event that will usually ruin the coupling as the tap-piece cannot be twisted out or drilled out.

Finally, simply return to the appropriate-sized bits and hand-turn them in the coupling's center-bores to clean out any metal burrs formed by the side-drilling and tapping. Viola! You've finished making a precision motor-shaft coupling for use with your slew-mirror, or other special effect mechanism.

Look Ma, no lathe!

(Book Reviews, continued from page 30)

commonly supposed. Consequently, Jesus was born a similar number of years later and, equally consequentially for readers of this journal, astronomers had to scan the sky of a different period to identify Matthew's Star. We found ourselves looking at planetary conjunctions during 3 and 2 B.C. rather than 7 and 6 B.C., and although the general storyline is similar, the astronomical details are certainly quite different. Historians have not yet come to a consensus (my own reading of the past 15 years is that interest is growing for Martin's chronology), but many of us have changed our planetarium presentations as a result.

There are two main differences between The Birth of Christ Recalculated and the newest edition of The Star That Astonished the World. First, the organization is immeasurably improved. Rather than wandering through and around subjects and then back to and around them again, as was characteristic of Dr. Martin's first books on the subject, the second edition of The Star That Astonished the World puts arguments in sequential order and builds as it goes. Gone is the feeling that "I thought I just read about that." Instead we progress through the topics such as "Who Were the Wise Men?" "Was the Star a Real Star?", "The Time of Jesus' Birth," "Astronomy and the Death of Herod," "The Lunar Eclipse of Josephus," "The War No One Can Find," "The Two Governorships of Quintillus Varus," and the "Census of Quirinius." Dr. Martin lays out his case, step by step, for his reorganization of the chronology of the "Dark Decade" that encompassed the death of Herod, the birth of Jesus, and a major (but almost forgotten) war in the Middle East.

Second, Dr. Martin has had 17 years to develop his arguments and to integrate new supporting material into them. His new book is far richer in details and his arguments are made in much greater depth. There is much new material on the "War of Varus," for example, and on the antedating of their reigns by Herod's sons. His new chronology leaves few ends unraveled and ties back on itself repeatedly to form a complete whole.

People who own earlier editions of this book will find these changes and additions so substantial that they warrant buying a new copy. It's another book. It is the essential book on the topic.

I find his chronology compelling, but I am only an amateur historian. It will be more interesting to see how professional historians view it and what they ultimately conclude. This new book presents a complete historical package that cannot be dismissed and that may have redefined the chronology of this most interesting period.
To planetarians who say:

"I’d control my theater with SPICE Automation if it cost less,"

Sky-Skan says:

**"OK!"**

The best media control system money can buy now costs less money. A lot less.

Take our new **THYME II** Data/Time Interface. It costs over 60% less than its predecessor. Our new **NUTMEG** utility cards make automated dimming and switching functions dramatically less expensive. New pricing on existing **SPICE Automation** hardware delivers even more savings.

If you’re planning a new or revitalized theater, call us for a quote. The best is within reach.
Preparations for Japan’s IPS ’96 conference consume everyone’s minds, and final touch­es are being made to plans for an exciting workshop of interest to portable users. Working with Loris Ramponi (Italy) and Lars Broman (Norway) to provide a unique and interesting workshop has been a rewarding experi­ence for all participants who will be both inspiring and fun. Announcements will be made during this workshop about a new Starlab cylinder and also the initiation of a contest involving the Starlab “clear” cylinder. These announce­ments will then be repeated in the September ’96 Mobile News Network column.

American Teacher in Italy:

Several applications have been received from highly qualified planetarians for the experience of a week in Italy. Our decision will be made soon and the participant will be announced in the next column. Don’t forget—this will be an annual opportunity. Think about applying for 1997.

Correspondence:

Jim Beaber (200 Kipling Street, Lakewood, CO 80226 USA; e-mail jbeaber@teal.csn.net) wrote to remind me of the wonderful time we had at the POPS ’89 training in San Francisco and to tell me what he’s up to these days. He tells me, “I ran a small planetarium in the Ft. Lupton, Colorado school district for 14 years before taking over the Jeffco Planetarium this past year after the previous director retired. It’s been quite a change and a lot of fun. We have over 45,000 student visits per year, and work closely with two district observatories at our outdoor lab schools up in the mountains. I persuaded the district to replace the old Goto star projector with a new Zeiss last summer, and have been doing a lot of work on that and getting things up to speed in related areas.

“Although the facility is a moderately large one (10.1 meter dome) I have found that, ever since POPS, my sympathies and instructional style have been far more in synch with the Starlab planetariums and the POPS philosophy than with the ‘star theater’ mind-set so prevalent in the IPS today. I’d like to get involved with your group and get different ideas for the programs here. We are doing strictly live educational programs and we do not do any of the canned, pre-recorded, 200-slide megashows.”

I sent Jim a heart-felt “Hello Again.” We had a wonderful time learning about interactive lessons at that first POPS session because the whole group of people involved were very upbeat and interesting. I also sent him some information about the Portable Planetarium Committee and the public domain files as well as some information about our latest projects. I am so happy he wants to get involved.

Paul Floyd (Southern Star Education, Lot 25 Doncaster Drive, Beechmont Q. 4211, Australia; e-mail s336167@student.uq.edu.au) writes, “I am writing to say I joined the International Planetarium Society in June of 1995 .... I have been reading your column with interest as we are starved of information ‘down under’.

“In fact reading the first copy of the IPS newsletter was a bit like a breath of fresh air-reading about people working in planetariums. Up until then, I have been limited to astronomy magazines. Professionally starved’ you might say. (I have also just sent away my membership application to ‘The Astronomical Society of the Pacific’—to get even more information) ...

“I have been running a small business/service for two years offering planetarium programmes in a Starlab planetarium to primary and secondary schools. I have made a few customized projectors—Milky Way, ‘N.E.W.S.’ direction projector and projector for measuring the height of the sun at midday throughout the seasons (every 10 degrees). The inspiration for these has come from receiving the ‘PASS’ manuals with the Starlab. I also use a slide projector and wireless microphone in the planetarium (as I speak all day). Most (90%) of my work is done with primary aged students ...

“Unfortunately, it has been an eye open­ing experience as we have discovered how poorly science is taught in schools (i.e. the primary ones we work in). Apparently, for the last 30 years, there has been no emphasis placed on science by the state governments—with the result little is done. (I say apparently because we only moved here 4 years ago and this information has been gained by talking to other ‘locals’). So I sympathize with what I have read about in the newsletter about sim­ilar comments in your country. You could probably guess how all this affects our income!”

Paul goes on to ask for information about acquiring materials from the public domain files, locations of people who have experi­mented with alternative bulbs for the Starlab projector, people experienced in the use of GOTO EX-3 in the Starlab dome, and he included an announcement of a conference he is involved in organizing for 1997. Their first conference in 1994 attracted 19 teachers/individuals. The second in 1995 attracted 47 and they are aiming for 100+ in 1997. This Southern Star Conference will be held in Brisbane on March 15, 1997 and will be jointly run by the Brisbane Astronomical Society and Southern Star Education. Paul states, “The organizing committee is seeking the following: speakers for the conference, funds to allow the above speakers to attend the conference, educational materials (samples) to display at the conference. (You might have damaged stock which is unsellable. Due to the lack of a budget, we would not be able to return this material. It would be kept for the following conferences). Or suggestions for who we can approach for the above. We would appreciate even a written letter of support from your organization for what the Southern Star Conference is attempting to do. A letter of support would be helpful in ‘proving’ to the education department authorities that the aims of the conference are important and worth supporting properly.”

I sent the information requested and a letter of support. I encourage you to help Paul in any way you can. Thanks for writing, Paul; it sounds like you jumped into this new career with both feet. I like your newsletter, Astronomy For Teachers, your spirit, and your enthusiasm to network (my pet goal). Keep up the good work and stay in touch.

Jim and Shirley Smith (Kensington Starlab Planetarium, Kensington House Limited, Box 215, Chickamauga, GA 30707-0215; e-mail starlab@ccc.net) wrote to get some of the new materials in the files and to ask if IPS has a homepage which would reference the materials available from the Portable Planetarium Committee. (This is in the works.)
Ray Worthy (15 Queensberry Avenue, Hartlepool, Cleveland, TS26 9NW, United Kingdom; e-mail Raymond@STARGAZR .DEMON.CO.UK) is the most prolific e-mail writer and my valued UK connection. He writes, "As soon as we got back from Italy it was all hands to the pumps in the construction of a planetarium dome built for a gentleman new to our fraternity, by the name of John Napper (3 Blewberry Road, East Hagbourne, Didcot, Oxfordshire, UK). You'd like him. He is a postman with a very happy family of two young children, a boy and a girl. He lives in a country village about ten miles south of Oxford. It is a delightful place. Behind his house is a long green garden. When you walk down the garden, a dome confronts you. This is an observation dome. There is a larger dome further down and this is another observation dome converted into a small planetarium. School and Scout groups come to programmes there in growing numbers and the two children accept it all as a part of their normal existence. It was but a small step for him to decide to go peripatetic with a mobile dome. As he already has his projector, an Apollo, he did not require the whole apparatus and he liked what he saw of one of my domes. He placed an order with me and I complied. Josie (Ray's wife) and I made it after our return from Italy (late October) and delivered it to his home on the last day of November. We spent a couple of hours in a local school showing him the dome. He seemed pleased with it."

I asked Ray to examine the public domain materials in my files to determine the value of placing some of them in a booklet of tips for portables. His comments: "I collected the box of your stuff from Undine Concannon and have begun to farm some of it out to local school customers of mine to get some reaction. I have already begun to form an opinion of one aspect of the work. Before I started using inflatable domes, I taught astronomy to examination standard. The exam won't mean anything to you, but was a national exam for sixteen-year-olds. The aspect I wish to discuss is the drawing of constellation figures. I find it most useful to keep the figure restricted to the positions of the stars in the sky and not to let the imagination rip. Often, the drawings have no reference to the astronomical content. Such figures, used at the younger levels, confuse pupils when they are presented with the actual sky and they are absolutely useless for teaching astronomy to the older ones. I prefer to present the children with the star maps and let them see why such groups got their names. To this end I find the use of star map programmes which can print out the sky for any date, place, and time on earth extremely useful. Not only can you show simple maps of the stars, but you can gradually introduce the dimmer stars bit by bit. The programme I use is called 'Skymap 2.2' and it is absolutely brilliant for printing maps. It is so quick and easy. It was written by a young fanatic living in Cheshire, England. We haven't met, but we correspond from time to time. You can get a shareware version from the net, but I subscribe to a more developed version. It did not cost much. Details can be obtained in America from: J.A.S.C. Inc., 10901 Red Circle Drive, Suite 340, Minnesota, MN 55343 or Internet 76226.2652@compuserve.com"

To cut a long story short, the bulb experiments are still going on. One of the bulbs proved to be the equivalent to the Starlab bulb with a better pin structure, so that I could construct a simple handle for the lamp and it could be changed without skin contact. It retails at $10 if you buy from 1 to ninety nine. The life is quoted at 4,000 hours. (Welch Allyn Inc., Lamp Division, 4619 Jordon Road, Skaneateles, NY 13152 - Phone number: 315-685-4560 "Precision Lamps" catalogue # is 01213). I passed this info along to Phillip Sadler by snail mail. The other high powered bulbs proved useless for Starlab purposes because they have a longer filament and it shows on the screen. However the Cosmodyssee projector does not use photographic film but uses plastic of some thickness. This allows a filament of longer dimension to be used. In fact, the bulb used is underpowered but has a longer filament. I have sent one of the higher powered lamps down to London where Peter Bassett is going to try it out ... I'll sign off now and go to play a game of table tennis in my large dome. Incidentally, now I am getting use to the bulb name for what its worth"

In another note Ray told me, "A couple of years ago, when my efforts with the first dome got some exposure in Astronomy Now, a British magazine, a gentleman (Tom Raabe) wrote to me from Sydney making inquiries. In his correspondence was an address which I returned from Italy (late August) and delivered it to his home on the last day of November. We spent a couple of hours in a local school showing him the dome. In short (is that possible Ray ??), he is now operational himself and is making inquiries. He already has his projector, an Apollo, he may be useful to you in your worldwide contacts. I am trying to get him a set of copies of your 'box'. His e-mail address is john@astronlga.co.uk"

I had heard of the Australian dealer before Ray contacted me but not Tom Raabe—I will try to search him, as well as John Brown, out. Ray is an energetic and entertaining correspondent and so helpful in sending me new contacts. Thank you very much Ray."
**Educational Software**

I have just begun having fun exploring this program and it is great so far! You can get a copy at your nearest NASA Teacher Resource Center or call NASA CORE (216) 774-1051, extension 293 or 294. You can get this program for very little money (maybe about $20 USA).

Astronomy Village: Investigating the Universe (Lorain County JVC, 15181 Route 58 South, Oberlin, OH 44074 USA; Phone (216) 774-1051 Ext. 293/294) Copyright 1995 by Wheeling Jesuit College/Classroom of the Future. Astronomy Village was produced and developed by the National Aeronautics and Space Administration (NASA), Cooperative Agreement NCCW-0012. "This is an exciting multimedia program that supplements high school curricula. Although designed for ninth grade, the software can be used at other grade levels. Ten investigations cover a broad cross-section of current research areas in astronomy. Each investigation encourages students to participate in scientific inquiry as a member of a cooperative learning group.

The Village is the first of many multimedia applications being developed by NASA's principal national research and development center for educational technologies, the Classroom of the Future (COTF) at Wheeling Jesuit College. The Astronomy Village reflects federal and NASA education goals and is aligned with national science education standards.


**Day of Planetaria-International Contest:**

(See the accompanying sidebar at right)

**Starlab News:**

Two articles in the latest "Starlab News" newsletter especially caught my interest: “Using Starlab to Implement the National Science Education Standards from the National Resource Council (USA)” and “Funding Update.” The first article outlines just what the title indicates and could be

---

**International Contest**

**An Idea for the Logo of the Annual “Day of Planetaria”**

The Italian Planetaria's Friends Association, in collaboration with the Observatory and Planetarium in Presov (Slovakia) and other European planetarium institutions, and with the support of the Serafino Zani Study and Research Center, organize a contest for the Logo of the annual "Day of Planetaria". Professional or amateur graphic designers can participate presenting a project by October 15, 1996, to the contest secretary.

The mark logo can include:

- The representation of an astronomical subject, or of a planetarium dome or a star projector (this one does not have to describe a specific instrument, the logo must not advertise a particular planetarium product);
- The followings words: "Day of Planetaria;"
- The logo will be drawn in black and white and in two formats (21 centimeters and 10 centimeters base).

Each participant can present more than one drawing in the contest.

All the drawings for the contest will be exposed in a simultaneous exhibition that will be held in different planetaria of different countries on March 23, 1997, in occasion of the next "Day of Planetaria". The drawings will also be published in the quarterly Il Sagittario, edited by Serafino Zani Study and Research Center.

All the drawings will be examined individually by the planetarians of a pre-committee: Jartgiga Biala (Observatory and Planetarium in Olszyn, Poland), Lara Bromab (Nordic Planetarium Association - Broman Planetarium, Goteborg-Angered, Sweden), Stefania Lenzova (Observatory and Planetarium in Presov, Slovakia), Susan Reynolds (IPS Mobile Planetarium Committee - OCM BOCES Planetarium, Syracuse, NY, USA), Zina Sviedrikiene (Vilnius Planetarium, Lithuania).

Each participant of the pre-committee, without knowing the name and the country of the authors, will choose the five best works among all the drawings.

A committee, composed by the astronomer Mario Cavedon, representative of the Italian Planetaria's Friends Association, by Patricia Lipowska, representative of the Observatory and Planetarium of Presov and one artist/designer elected by Serafino Zani Study Center, will choose the best drawing among the total number of the works, without indication of the name and the country of the authors, selected by the pre-committee. The best drawing will be used for the logo of the yearly "Day of Planetaria".

The authors of the first, the second and the third drawings selected by the committee will receive a commemorative plate and a gift from Serafino Zani Study and Research Center. The first prize winner will receive also 600,000 lires from the Serafino Zani Study and Research Center, while the second prize winner will receive 300,000 lires offered by the American planetarium firm "Spitz" and their Italian representative "Auriga srl".

The first drawing selected by the committee could be used free as Logo of the "Day of Planetaria" by all the planetaria that collaborate in the initiative yearly. The drawings will not be returned and will remain property of Italian Planetaria's Friends Association. The total or partial use of the other drawings is reserved to the organizers, with the authors' permission, unless requested by the authors to be returned.

For other information, and for the sending of the drawing, contact the secretary of the contest:

Centra Studi e Ricerche Serafino Zani
Via Bosca 24 - C.P. 104
25066 Lumezzane (Brescia) - Italy
telephone 30/871861
fax 30/872545

**Data to Enclose with Drawings**

(Each participant can present more than one drawing in the contest.)

Name ________________________________
Address ________________________________
City ________________________________
Country ________________________________
Please insert your postal code in the proper space
Occupation ________________________________
Year of birth ________________________________
Description of the drawing/s (optional; please attach): ________________________________
used by many of us when printing (justifying?) curriculum and/or developing curriculum. You can request a copy of this newsletter from LTI; ask for Starlab Issue XV, Spring/Summer 1996 (see phone/e-mail below). The second article states that if your organization is tax-exempt under IRS Code 501 (c) (3) you may seek funding from: DuPont Corporate Contributions Program, National Science Foundation Instructional Materials Development, NEC Foundation of America, The Bay Foundation, The Coca-Cola Foundation, The Hitachi Foundation, and Toyota/TAPESTRY Grants. If you need additional information on grant writing and funding sources for a Starlab, contact LTI at 800-537-8703 (or write them at their new e-mail address starlablti@aol.com) for a free copy of "Grant Writing: Secrets of Success" (Issue XII, Winter 1995 of Starlab News) and/or the Learning Technologies "Funding Guide".

Signing Off:
That's all for this time—hope to see many of you in Japan.

Vol. 25, No. 2, June 1996

Original National Geographic Society-Palomar Observatory Sky Survey to be Available on 8 CD-ROMS from the Astronomical Society of the Pacific

The Space Telescope Science Institute and the Astronomical Society of the Pacific announce the availability of RealSky CD, the digitized Palomar Observatory Sky Survey compressed by a factor of 100x, available on 8 CD-ROMs. Software included allows users to view images under Windows 3.1, 95, NT, Macintosh, UNIX, and VMS systems. The more than 800 plate images are digitizations of the E plates, taken with the 48-inch Schmidt telescope on Palomar Mountain during the 1950s RealSky CD is a more compressed version of the original Digitized Sky Survey (DSS) which was made available on 102 CD-ROMs two years ago. The DSS was compressed by a factor of 10 and offered images that were nearly indistinguishable from the original data. The 100x compression of RealSky is not suitable for professional research activity but provides an invaluable tool for educational and amateur communities. The cost is $225 prior to July 1, 1996, and $250 after July 1, plus shipping. To order, contact:

The Astronomical Society of the Pacific
RealSky CD Orders
390 Ashton Avenue
San Francisco, CA 94112 USA
(1) 415-337-1100
(1) 415-337-5205 fax
asp@stars.sfsu.edu

"MoonWitch"

Ideal for grades 2nd through 5th, and super as a family Halloween program, this planetarium production examines the nature of the Moon and its changing appearance in the sky. On Halloween we meet Billy and Diana, a brother and sister who are trick-or-treating. Diana notices that no matter where she goes, the Moon seems to follow. Back home, Mom and Dad explain Moon appearance and motion. At school Diana continues to share her new knowledge of the Moon with classmates and demonstrates why the Moon goes through phases. The program ends with Diana’s discovery of the "dark side of the moon" and "earthshine." She tells her father that she sometimes dreams of being the first woman to land on the Moon... walking in the footsteps of the Apollo astronauts! And... her lunar lander is named "The MoonWitch."

Authored by Phil Groce.
Running time of about 17.00.
Includes 55 pinregistered glass-mounted slides.
Original art by Jim Chapman of Sudekum Planetarium.
Digitally mastered soundtrack featuring rich sound effects and an original music score by award winning composer Jeff Bowen.
Review committee: Steve Mitch, Christine Brunello, George Reed, and Sharon Parker.

Tape formats: DAT, 16 ips 1/4" 2-track, 4-track cassette. Add $15 for ADAT digital format.
Order now! Price: $375 (check with order) $395 with purchase order. Add $60 for custom kodalith masks.

"MoonWitch" by Bowen Productions

From the creators of
"LifeStyles of the Stars" and
"Sandy, Pepper & the Eclipse"

Perfect as your next Halloween program!!!

AstroNotes by Bowen Productions

3590 North Meridian Street • Indianapolis, Indiana 46208 • 317-923-3838 • Fax 317-923-3871 • bowenprod@aol.com
the even distribution of sound for all members of the audience. Other planetaria may expect to achieve the same fine results as they blend in the use of the USM to their own operations.

Working in concert with a prescribed plan of installation, the USM balances perfectly all recorded sounds, voice, and music, and then levels, mixes, delays, and distributes the correct combination to the proper speaker locations. The resulting effect is that every speaker is used as sound reinforcement for every other speaker location, giving an unparalleled distribution of even sound. With the USM the sky show producer or the sound engineer can program their existing sound system to respond with voice, music, and sound effects across the domed ceiling of the planetarium theater. The USM's unique sound delay technique allows every listener in a theater to hear music, voice, and sound effects equally, as they happen, and with unequalled clarity as they match the action of the show across the sky. With the USM, one can thrill audiences with convincing demonstrations of the Doppler shift, or, set off stellar explosions across the dome of the theater, and every member of the audience will hear the sound equally, no matter where they sit.

A breakthrough concept that will not break your budget, the USM can provide an audience with the kind of audio fidelity and true sound balance that is attainable for every size of planetarium theater. In addition to the full-sized unit The Adler Planetarium enjoys in its Sky Theater, the USM is now available in a more compact unit to match the size and existing audio format of every planetarium. This means that the smaller theater can achieve the same full delivery and perfect quality of universal sound that audiences in the larger theater already enjoy.

To avoid replacing existing audio components, the USM supports all audio formats, including all digital sound techniques, and is readily integrated into a planetarium's existing sound system. The unique advantage with the USM is its inherent compatibility not only with components of existing sound systems, but with emerging improvements, even in such entertainment technologies as high-definition television.

As audiences are increasingly discriminating in their choice of information and entertainment, the planetarium that draws its audiences with sky shows must continue to find informative and entertaining ways to attract and keep new and returning visitors. With the likelihood that digital innovations, such as home theater and sophisticated home-based audio, will become increasingly available in the consumer market, the planetarium must maintain a quality edge to remain competitive. With the increasing sophistication of audiences and the quality of theater these audiences have come to expect, digital innovations, such as the Universal Sound Matrix, allow the planetarium to maintain that edge.

Astronomy Education: Current Developments, Future Coordination
ASP Conference Series Proceedings Volume 89
Now Available

Astronomy Education: Current Developments, Future Coordination may well be the most important book published in the history of astronomy education, and is the first comprehensive look at the many facets of astronomy education in North America. It is the proceedings of an ASP symposium, held in Maryland in June 1995, which attracted over 150 of the most active astronomy educators, from both schools and colleges, and from the informal science education community. Almost all of these individuals contributed to this volume through the plenary papers, contributed poster papers, small-group discussion reports and general comments.

The plenary papers begin with an overview of astronomy education worldwide and in the U.S., then critically examine curriculum reform, research on students learning processes, hands-on activities and teaching resources (electronic and otherwise), and the roles of NSF, NASA, AAS, national observatories, professional astronomers, and planetariums. The needs of two-year colleges and of under-served populations are specifically addressed. An innovative feature of this book is the reports of the eight small-group discussions: post-secondary astronomy, K-12 astronomy, teacher preparation, informal science education, public education, reaching undeserved groups, creating networks and coalitions, and appropriate technology. These reports are followed by general comments and discussion.

Following the dozens of short papers on projects and programs, there are comprehensive catalogs of national astronomy education projects, and selected resources for teaching astronomy.

This book will inform and inspire everyone who is interested or involved in astronomy education at any level: amateur and professional astronomers, teachers, planetarians, and other astronomy communicators.

The cost of Astronomy Education: Current Developments, Future Coordination and all ASP Conference Series Proceedings volumes is $44.50 which includes shipping and handling within the U.S. There is a surcharge for shipments to non-U.S. addresses.

Orders for Astronomy Education, Volume 89 of the ASP Conference Series Proceedings. (copyright 1996, ISBN #: 1-886733-10-4) by check, purchase order, or credit card (Visa or Mastercard) should be sent to:

Astronomical Society of the Pacific
Conference Series Orders
390 Ashton Avenue
San Francisco, CA 94112 U.S.A
fax: (1) 415.337.5205
asp@stars.sfsu.edu

Planetarian
Vol. 25, No. 2 , June 1996
SPITZ
multi media systems

Planetarium
theatre
exhibits

SPITZ, INC., P.O. Box 198, Route 1, Chadds Ford, PA 19317 USA Tel: 610.459.5200 FAX: 610.459.3830
Occasionally, I have to write something. I have to compose a document, to be put on paper, for someone else to read. It might be a letter, a lesson plan, a test for a class, a newsletter, etc. So I begin ... I take out my ruled writing pad and start scratching away. Computer geeks tell me I'm crazy. They say: "How can you "delete", "insert", "cut", "move", format on a piece of paper? Use your computer keyboard and monitor to compose a document!" "Can't do it," I say. I still have the "yellow legal pad" mentality for writing compositions. I leave plenty of space between lines; liberal use of arrows, cross-throughs, and proofreader marks allows me to "delete", "insert", "cut", "move", and "format". Don't get me wrong. I do use the computer after the "yellow pad" phase. I go right to the computer to enter it (computer geeks don't consider the word "type" appropriate, but it still feels like typing to me). I then "pretty it up", check my spelling, and print it in crisp letters. I have embraced the computer, the Internet, the whole works, but on my terms. Here's what I mean:

- I stick to one font and point size most all the time, and only occasionally throw in italics, boldface, or underline. Duncan Teague, Planetarian from Cragmont Planetarium in Memphis, Tennessee says, "You can always tell when someone has just learned how to use fonts on the computer. Their first document looks like a ransom note."

- Suppose I want to put a graphic into my document. If I need a picture or drawing of, for example, a comet, I cut and paste. By "cut and paste", I don't mean "import an object from a clip art file" or "scan a picture". I mean "print the document with appropriate empty space, cut a picture out of a book and paste it into the space, and then find a good copy machine." (I defy you to tell the difference and I bet I can do it faster than you can look through hundreds of clip art images looking for one which sort of looks like a comet. I've got lots of astronomy books and magazines with pictures of comets.)

- I still use my Apple IIe for lots of documents because 1) it's next to my desk, 2) it has a printer attached, and 3) I can produce a document as I think of it. At my school, the fancier, newer machines with crispier, prettier printing are often in use. You may have to wait in line, or in some cases, the printers are in different places than the computers. Ah, progress! I'll bet you can still read my Apple IIe message. (Did you know that Apple IIe has spreadsheet and database capabilities?)

- I'm taking a computer class emphasizing educational uses of the computer; we're currently producing "slide shows" using "Powerpoint". Will I ever use it outside of this class? I don't know yet. Just because I can do it doesn't mean I will use it.

- I love e-mail, but I don't feel compelled to read it every day, only when I feel like it. If you want to talk to me, better call me on the phone. You won't get an answering machine if you really want to talk to me and I'm not home, you'll call back. (I don't need a machine which places the responsibility for making contact back on me when it's really you that wants to talk.)

- I have joined several computer newsgroups. I have learned to delete most e-mail after I read it, even if it's very interesting because I have finally passed through all the stages of e-mail insinuation:

  Phase 1) I must read it and print it, because someone else may want to read it too.
  Phase 2) I have stacks of printed e-mail messages and when I look at them, I don't remember why I printed them.
  Phase 3) I get to it when I can and scan it.

Overheard:

- Tony Butterfield, 71514.3145@compuserve.com, of Planispheres Productions, is fond of e-mail, too. He moves around a lot and his only address is his e-mail address. He calls it his virtual office. He says, "When you're on the edge of new technology, you're on the verge of "vaporware".

- The staff of the Einstein Planetarium at the Air and Space Museum in Washington, D.C. sees many important scientists because of the national significance of the museum. A couple of scientists from the Smithsonian at Mauna Kea during a project to figure out the absolute velocity of Venus' winds. During their stay in D.C., staffer Geoff Chester was assigned to them, as liaison and facilitator (read "gopher"). The scientists brought everything with them to match images of Venus except they could not get the template to fit the camera image. Geoff, observing their distress, scrounged around and found some translucent plastic. He suggested that they use it to project the image and move it to get the desired image size. The procedure worked well. The scientists were amazed. "Why couldn't we have figured that out?", they wondered. Geoff shrugged his shoulders and said, "You never worked in a planetarium."

- Advertisement from the "domeless Planetarium" seeking employment, Alexandra Lovell from Wollastron Wellingborough, Northants, UK on Dome-L. (Planetarian news-group on Internet): "good with children, senior citizens, animals, and Ektographics"

- Planetarian Matt Linke of University of Michigan Museum of Natural History in Ann Arbor: "It was a rainy day. We were getting to the end of our summer [planetarium] show called 'Night Lights'. It ended with a typical eight-minute thunder, lightning, and rain storm. People in previous showings really loved the rain effects which included a few sprinkles with water pistols. A summer camp group was viewing the show when the operator, nearing the end of live discussion, began introducing the effects of the storm and preparing the audience for what was coming. At this point, the leader of the group camp group exclaimed: 'Wait a minute! We're inside! How can what's happening outside possible effect what we are doing in here? The operator assumed she was kidding. The storm slowly rolled in, the lightning flashed, and it began to rain. Suddenly, amid the flashes of lightning the operator noticed that this leader's umbrella had gone up and she was pulling the little ones near her under it. Shortly after, she told her charges: 'Well, this is really too bad! I guess we're rained out so we should head out to the buses!'

- Dennis Mammana, Planetarian from Fleet Space Theater in San Diego: "After many months of taking my sky photos to my framer, she showed me a certificate of a star that someone had purchased for her. Not knowing much about astronomy, she asked if I might show her 'Candace' in the sky. Being interested in more than just stars, I agreed and began to compare the star map they sent with a 12th magnitude database. The star they had circled was not there. 'Wait a minute', I thought, 'if the star is bright enough to appear on a map of 5th magnitude stars, why isn't it in the database?' After checking several other databases with similar luck, I got suspicious. So I examined the area with a magnifier, and sure enough, the company (no names mentioned, but their initials are IRS) had added a star with a felt-tip pen!!! Well, we scoured the area anyway with a 21-inch telescope and saw a number of stars that could have been 'Candace' (if there even was such a thing!) Candace was happy, since she learned a lot about the sky. I was happy because I learned a lot about Candace. She's now my fiancee.
This is what the world's toughest audience had to say about America's first Minolta Infinium Planetarium:

"The most dramatic and realistic sky I've ever seen."
"In the future, all planetariums should be built this way."
"There was such detail...like looking at stars from a mountaintop."
"This is easily the most powerful planetarium ever made."
"Wow!"

Last July, Florida's Brevard Community College hosted the International Planetarium Society. Pictured above are some of the nearly 500 planetarians from around the world who gathered to exchange ideas and witness America's first Minolta Infinium Planetarium. The result was nothing less than dazzling. For more information about the Infinium and other model projectors, call your nearest Minolta representative today.

After all, at Minolta we know that once you have seen our sky, you too will believe.
DIGISTAR II
IS THRILLING PLANETARIUM VISITORS AROUND THE WORLD

Hansen Planetarium
Salt Lake City, Utah

The London Planetarium
Madame Tussaud's

University of South Carolina
Aiken, South Carolina

Hakui City Planetarium
Ishikawa Pref., Japan

College of Southern Idaho
Twin Falls, Idaho

Kalamazoo Community College
Kalamazoo, Michigan

Armagh Planetarium
Armagh, Northern Ireland

Orlando Science Center
Orlando, Florida

Redlin Art Center
Watertown City, South Dakota

Delta College
Bay City, Michigan

Yaizu Discovery Park
Shizuoka Pref., Japan

The Henry J. Buhl Planetarium
Carnegie Science Center
Pittsburgh, Pennsylvania

Columbus College Planetarium
Columbus, Georgia

AND THE LIST GROWS ON...

We're excited that these prestigious institutions will be using Digistar II to entertain and educate their audiences. Digistar II is the world's only digital planetarium system for dome theaters. Call us today to find out what all the excitement is about!

EVANS & SUTHERLAND

For more information about DIGISTAR II, contact Jeri Panek at:
EVANS & SUTHERLAND • 600 Komas Drive • Salt Lake City, UT 84108 • Phone: 801-582-5847 Fax: 801-581-9852

Image courtesy of Digistar Users' Group