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

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IPS Web Site
http://www.ips-planetarian.org

Produced at the Griffith Observatory, Los Angeles, California; http://www.GriffithObs.org/IPSPlanetarian.html
Vol. 31, No. 2, June 2002

The final deadline for the September issue is July 21.
Gender and the American Planetarium Community

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Introduction

Gender-specific divisions of labor within the pre-1940 American astronomical community have been profiled by historian John Lankford. Women who aspired to work in astronomy often performed routine labors in factory-style observatories. Women astronomers were victims of a “dual labor market,” characterized by “limited mobility, low pay and limited room for intellectual independence.” Historian Margaret W. Rossiter has argued that an institutional “logic of containment” long enforced “segregated employment and underrecognition” for women scholars. Behind this scenario lay the “basic social desire to restrict women to the lower levels of the academic hierarchy.” Such actions contradicted supposed meritocratic practices of hiring and advancement that in reality applied only to men.

This paper argues that, before equal-rights legislation was passed, gender-specific differences often characterized employment patterns found among America’s major and smaller planetaria. Within the former category, the careers of Maude Bennot and Marian Lockwood demonstrate the persistence of gender biases and warrant an extension of Rossiter’s concepts to the popularization of science.

Rossiter’s analysis of gender biases present in the scientific reward system describes how “extrascientific assets” were needed for women to achieve parity with men. “Chief among these additional factors was the enthusiastic backing of powerful and politically astute male colleagues, without whose support even the most meritorious work would go unrewarded.” Yet, reliance upon male allies constituted a precarious arrangement for women. If or when that support system collapsed, guarantees of sustained employment were lost as well.

Historians have paid little attention to women’s roles as astronomy educators in America’s planetaria. Before 1940, five major installations were opened in Chicago, Philadelphia, Los Angeles, New York, and Pittsburgh. All were equipped with Zeiss projectors and had domes at least fifty feet in diameter. Smaller, non-Zeiss planetaria only began to proliferate after 1947. This paper argues that, before equal-rights legislation was passed, gender-specific differences often characterized employment patterns found among America’s major and smaller planetaria. Within the former category, the careers of Maude Bennot and Marian Lockwood demonstrate the persistence of gender biases and warrant an extension of Rossiter’s concepts to the popularization of science.

Maude Bennot and the Adler Planetarium (1930-1945)

Maude V. Bennot (b. 1892) graduated valedictorian of her class at age 16 from Thornton Township High School in Harvey, Illinois. She was accepted into Northwestern University at Evanston, Illinois in 1912, but did not complete her bachelor’s degree until 1919. Her undergraduate major was mathematics; her related minor was astronomy and her unrelated minor, public speaking. She returned to Northwestern to pursue graduate studies in 1924. Working under Dearborn Observatory director Philip Fox, Bennot completed requirements for a master’s degree in 1927, writing a thesis on the proper motions of forty stars. Her results were published in the Astronomical Journal.

After Fox was chosen to direct Chicago’s Adler Planetarium in 1929, he secured Bennot’s appointment as assistant director. She and Fox designed the Adler’s regularly-changing schedule of monthly programs that comprised an introductory course in astronomy. Bennot was subsequently elected treasurer and second vice-president of Sigma Delta Epsilon, the national graduate women’s scientific fraternity, and later secretary of the Chicago Astronomical Society.

When Fox left the planetarium in 1937 to direct Chicago’s Museum of Science and Industry, Bennot was chosen its acting director. She thus became the first woman to head a planetarium facility in the U.S. (and probably the world). Bennot’s nearly eight-year appointment as acting director indicated a temporary concession which became ‘permanent’ by default. That arrangement, however, allowed the Chicago Park District board to release Bennot without recoup when such a move was deemed politically expedient. Her responsibilities were in fact doubled to include both the director’s and assistant director’s duties, although her salary remained fixed at the latter’s $4,800 per year, considerably less than Fox’s initial salary of $7,500. Bennot’s appointment was adopted as a cost-cutting measure and constituted an obvious form of gender discrimination.

Before and after she became the Adler Planetarium’s director, Bennot was subjected to the powerful effects of cultural stereotypes, which threatened to deny her recognition for those administrative duties. Chicago Daily News columnist Sydney J. Harris recounted these facts after conducting an interview with Bennot in 1944. “Park District officials,” he noted, “were skeptical of this slim, fragile woman. Masculine astronomers shook their heads dolefully, said she was more in place in a tearoom than in an observatory.” “The only limitations to a woman’s ability,” Bennot retorted, “exist in the minds of men”.

Bennot operated the planetarium much as Fox had done, with monthly rotations of show topics almost unchanged from their original formats. Yet her policy of retaining lectures devised years before led to negative repercussions. Continued economic depression and the coming of war brought cuts in budget, personnel, and attendance, leaving Bennot as the one-woman planetarium staff. She encouraged the teaching of celestial navigation to U.S. Naval Academy midshipmen. But in spite of thrifty management policies, popularity with the public, and fifteen years of devoted service, Bennot was suddenly removed from her position in 1945, following the death of her mentor, Philip Fox, from a cerebral thrombosis the previous year.

In her sequel volume on the career hurdles faced by women scientists, Margaret Rossiter has chronicled the “detrimental impact” brought upon women’s lives and careers by the postwar period. “Women’s wartime accomplishments, rather than justifying an increased role for women in the postwar world, were quickly forgotten” or deliberately obscured.3 Many were displaced and demoted without adequate explanation or justification by men who possessed inferior credentials and experiences. Like other women who had risen to high-ranking positions during the war, Bennot was slated for replacement by masculine authorities even before that conflict had ended.

The decision to have Bennot replaced with a man was engineered by Robert J. Dunham, Chicago Park District board president, and undertaken with full approval of planetarium donor Max Adler. Announcement of this change came at a board meeting held 26 December 1944, after Fels Planetarium director F. Wagner Schlesinger had been secretly appointed Bennot’s successor. In Dunham’s plan, Bennot would receive only three month’s salary in 1945. Afterwards, the assistant director’s position would be eliminated, preventing Bennot from reacquiring even her original means of employment. Bennot charged that “this action constitutes a subterfuge, an evasion of the civil service laws.”6 Dunham refuted this claim by arguing that the civil service rating on Bennot’s position had been abolished several years earlier. Dunham’s argument was challenged by Marvin J. Bas, an attorney for the civil service employee’s association, who termed the board’s failure to offer Bennot a full year’s salary “a willful circumvention of the merit system.”9 Bas, however, was unable to reverse the board’s predetermined objective.

Dunham reported that Adler and the board felt that the planetarium “has not fulfilled all its possibilities; has not attained the position in the scientific world it deserves.”10 In their judgment, public education justified only a portion of the planetarium’s purpose. In this respect, Bennot suffered from Fox’s conception of planetaria as institutions for teaching and research. But Dunham added cryptically that the facility “has not fulfilled its function to popularize astronomy.”11 These words implied a second criticism, namely that Bennot had failed to originate any new programs during her tenure as director. Both charges, however, ignored the success with which she singlehandedly administered the planetarium through prolonged national emergency. Schlesinger’s hiring was predicated on the fact that he was a man. Among his first actions as director was to institute a number of new programs; a move that found ready support. Embittered by her sudden dismissal, Bennot left the field of astronomy education forever.

Marian Lockwood and the Hayden Planetarium (1935-1945)

When New York’s Hayden Planetarium opened in 1935, its staff was the largest at any American facility and employed the greatest number of women. Marian Lockwood (b. 1899), a former student at Wellesley College and secretary of the Amateur Astronomers Association of New York, was one of three assistant curators appointed by director G. Clyde Fisher, including Arthur L. Draper and Dorothy A. Bennett, a University of Minnesota graduate and member of the American Museum of Natural History’s education department. William H. Barton, Jr., was appointed associate curator. Each of Fisher’s assistant curators received identical salaries, regardless of gender or level of educational attainment. Barton and Lockwood were suc-

The Hayden Planetarium Staff in 1935. Left to right: Miss Lockwood, Mr. Draper, Dr. Fisher, Mr. Barton, and Miss Bennett. Courtesy, Perkin Collection, Department of Astrophysics, American Museum of Natural History.
cessively appointed to the Hayden directorship, while Draper left in 1940 to direct Pittsburgh’s Buhl Planetarium. Only Bennett, who resigned her position in 1939, did not follow the above career pattern.

Lockwood’s interest in astronomical matters had developed at Wellesley College. At the Hayden Planetarium, she distinguished herself as a lecturer and writer, publishing two books, *The Earth Among the Stars* (1935) and *The Story of Astronomy* (1939), in collaboration with Draper and a third, *Astronomy* (1940), with Fisher. Lockwood also served as associate editor of *The Sky* from November 1936 to February 1938. Despite these accomplishments, she was not promoted to associate curator until May 1943. After Bennett’s departure, Lockwood remained the sole female presence on the planetarium staff.

Barton succeeded Fisher as the Hayden’s director in 1937. With the outbreak of European hostilities, he devoted extensive efforts to teaching celestial navigation and reportedly trained some 30,000 midshipmen. Barton’s “consuming desire” to give all towards the war effort contributed to the breakdown of his health and premature death from heart failure in July 1944. His place was filled by the last original member of Fisher’s staff when Lockwood was appointed the planetarium’s acting curator.

Little evidence remains of Lockwood’s activities during her single year in charge of the Hayden Planetarium. What is apparent is that she suffered a fate almost identical to that which deprived Maude Bennot of the Adler Planetarium’s directorship. On 1 September 1945, Lt. Commander Gordon A. Atwater, a naval officer who had taught navigation with Barton, replaced Lockwood as the planetarium’s chairman and curator. Before being commissioned in the Navy, Atwater was a lumberman and avocational sailor who had earned an engineering degree at Purdue University. More concerned with matters of protocol and authority than past loyalty or competence, Atwater eliminated both associate and assistant curatorial positions, reducing Lockwood to nothing more than a lecturer by 1946. She resigned several months later and obtained a more lucrative position with the Grolier Society, a New York publishing house. Like her counterpart Bennot, Lockwood never returned to planetaria or astronomical teaching.

Within America’s Zeiss planetaria, women were to be denied the authority and autonomy they had exercised during years of economic depression and war. Attainment of gender equity was a temporary measure, later erased by the ideology of male superiority. Gender biases continued to operate among major planetaria after 1945. Apprenticeship and advancement that were open to men remained virtually closed to women. In modern parlance, a ‘glass ceiling’ existed, which was not breached by women’s hands for another generation.

**Readmission of Women Planetarium Directors**

Women gained access to the post-war American planetarium community after Philadelphia entrepreneur Armand N. Spitz (1904-1971) introduced his Model A projector in October 1947. Those institutions which most readily acquired Spitz planetaria were smaller, regional museums and university/college physics departments. Few public schools could boast of a planetarium before federal legislation was enacted in the wake of Sputnik’s launch.

Regional museums were seldom devoted to scientific research. Instead, they interpreted the area’s local history or natural resources; young children and families became their primary audiences. These lower-prestige positions, offering a modest salary, were largely filled by women educators. Men, by contrast, did not find this type of museum work to be sufficiently rewarding, well-paying, or necessarily ‘masculine’. Within such institutions, women’s careers became self-empowering. A number of women museum directors thus procured and managed Spitz planetaria; a combination not possible at the nation’s Zeiss facilities. These opportunities seemingly offered women all of the professional responsibilities and rewards that they sought.

At least six women directed planetaria before the space age; some remained active in the following decade, when the number of women astronomers (and planetarium directors) increased sharply. Maribelle Cormack (1902-1984), curator of the Roger Williams Park Museum in Providence, Rhode Island, also directed its Spitz planetarium after 1953. Cormack participated in two national symposia on planetarium education hosted at Bloomfield Hills, Michigan (1958) and Cleveland, Ohio (1960). She wrote extensively in the fields of natural science and children’s literature and was awarded an honorary doctorate by Rhode Island College in 1966. Miss Charlie M. Noble, professor of astronomy at Texas Christian University, acquired a Spitz planetarium in 1949 and gave impromptu demonstrations until permanent quarters could be erected at the Fort Worth Children’s Museum in 1955. Noble was perhaps the first woman college instructor to employ the pinhole-style projector, although her teaching extended to junior astronomers. In 1956, Noble received the Astronomical League’s national award in recognition for her extensive youth mentoring program. Noble’s name was subsequently affixed to the Fort Worth planetarium, making her possibly the first woman to be so honored. Genevieve B. R. Woodbridge, who had earned a bachelor’s degree in education from the University of Minnesota, directed the Grout Museum of History and Science in Waterloo, Iowa after 1955. She opened its planetarium the following year and retained both directorships past 1970.

Maribelle Cormack. Courtesy, Cormack Planetarium, Museum of Natural History.
Maxine B. Haarstick. Courtesy, Minneapolis Planetarium, Minneapolis Public Library.

Conclusions

During prime years of the ‘feminine mystique’, women planetarium directors were few in number, largely discouraged from pursuing scientific or technical careers believed to be reserved for men. The typical career pathway open to men, which led to the directorship of a major planetarium, remained virtually closed to women. Only within the nation’s smaller museums, universities, and school districts were the barriers to women’s participation as planetarium directors gradually removed. While their numbers and status remained far short of the marks attained by male colleagues, a few stereotype-breaking women attained both planetarium and museum directorships. While not all-inclusive, this pattern reveals the largest gender-specific differences in post-war planetarium management. Whether by constraint or desire, these women evidently looked no further toward possible careers in the nation’s major planetaria.

In steadily growing fashion, women began to act as a positive force for change within the American planetarium community. Their presence under the dome served as an important role model and demonstrated that girls as well as boys could learn about the heavens. For those few women who embraced this challenge, neither size of dome nor type of planetarium instrument mattered. Regarding the supposed distinctions between large and small planetaria, Haarstick replied that the dome’s diameter “tells us nothing except how to figure its circumference.” What counted most was being allowed to present astronomy lessons to children and adults in enthusiastic and entertaining fashion. But the fewer and lesser rewards these women received, along with the motivations which guided them, remained primarily intrinsic. Louise L. Morlang directed the Townsend Planetarium at Charleston, West Virginia’s public library, while Claudia Robinson supervised the Dallas, Texas Health and Science Museum’s planetarium.

Before the launch of Sputnik, the woman who achieved the highest recognition from planetarium colleagues was Maxine (Begin) Haarstick (1922-1985), curator of education at the Minneapolis Public Library’s Science Museum. Haarstick earned bachelor’s and master’s degrees from the University of Minnesota. When the American Association of Museums (AAM) held its 1952 conference in the Twin Cities, Haarstick’s institution hosted the first official meeting of the AAM planetariums section. Its five-member panel offered discussion on the topic, “Planetariums, Their Use as a Community Service.” Haarstick’s active role in the planetariums section, gauged by almost yearly presentations, led to her selection as chairperson of its 1957 meeting. She became the first woman to attain such recognition from male-dominated colleagues. Haarstick was re-elected chair of the AAM section in 1964. Her most notable paper, “How to Succeed in the Planetarium,” was published in Museum News. Haarstick’s career was capped by assuming planetarium and museum director’s posts concurrently after 1959. More recently, Jeanne (Emmons) Bishop (b. 1943), director of the Westlake, Ohio schools planetarium, earned a doctorate in astronomy education from the University of Akron in 1980 and was elected the first woman president of the International Planetarium Society (1983-84). These careers are among the most successful of the community’s women planetarium directors.

(Please see Gender on page 36)
In November of 1973 a 28-year association with Griffith Observatory, and with planetariums worldwide, began with the premiere of LASERIUM®. That association ended with the closing of LASERIUM® at the Observatory this January 5th. But it actually wasn't interrupted periodically by sojourns at San Diego State, Northern Arizona and Lowell Observatory, and a full-time day job while attending USC Cinema at night.

My on-and-off guide work ended in 1968, but I was back at the Observatory in December of 1970 with a new laser, LASERIUM®. Thus it was that Dr. Garmire and I brought a small helium-neon red laser and a lumia diffraction wheel to generate those gyrating interference patterns among the stars on the dome. It was transfixing; a 10-minute planned demonstration stretched to 45. And then the record was turned over for more. But the answer was “no.” So we went away and did some laser work in films, tours (rock and classical), and openings — all firsts. Then in June of ’73 my new partner, Charles McDanald, and I set up a demonstration at a Caltech lab kindly loaned by Dr. Garmire, and we invited about 120 people to witness our borrowed full-color Krypton gas laser and a battery of new effects. Only two people showed up, but they were Ron Oriti, who had stepped up to Associate Director, and William Kaufman III, the new Director of the Observatory (and at

Scene from “Blue Danube” selection in the original LASERIUM® show at Griffith in Los Angeles.

Griffith patron and trademark “Blue Danube” circles, mid-1970s. All photographs courtesy Laser Images.

the first. (Indeed, my first, and formative, experience of the Observatory was a trip to the moon courtesy of original Director, Dinsmore Alter, circa 1948.) Later, as a junior in high school and an amateur astronomer since middle school, I applied to Griffith Observatory for a guide staff position. I was turned down because I didn’t meet the age requirement. Disappointed, I tried again next year, and on graduation in June, 1956 began my first stint as a guide. Among my first colleagues was Ronald A. Oriti, with whom I began a lifetime friendship — especially during the next 12 years at the Observatory, 28 the youngest of any major planetarium). Dr. Kaufman was willing to give us a try and offered four otherwise “dark” Monday nights in November and December as a test to see if anybody would show up.

Again we went away, this time to build a projector and create a show. We finished the former at 5:00 a.m. on opening day, November 19, 1973 (the latter was a work in progress with several mutations to follow). I went home to shower and change, then returned downtown to appear at 7:00 am on Ralph Story’s “A.M. Los Angeles” show on ABC. As a result of that single five-minute spot — again
featuring lumia from a small red laser — we had two half-full houses at the scheduled 7:30 and 9:00 shows that night. (I have always believed that only in L.A. would this have been possible.) And at the end of the test run on December 10th we turned away an estimated 500 people from our 9:00 show. All of this was the result of word of mouth; we did no advertising. (Again, what can I say? It was L.A.) Dr. Kaufman called me to say that LASERIUM® seemed to be a viable addition to the planetarium schedule and proposed a continuation of the Monday time slots, resuming in January 1974, along with afternoon matinees.

When I climbed into the (now recently demolished) wooden stockade around the planetarium projector over 28 years ago to perform those early LASERIUM® shows, I had predicted we might run for 10 years at maybe a thousand guests per week. Fortunately, I was wrong.

I was also too conservative in my expectations for the response of the crowds, and I relish the memories of those first unsure steps into the technical and aesthetic unknowns — much of the original shows being made up as we went along! It seemed whatever we laserists did was OK with the audience as long as it was on the music beat. If the laser shut off during the show because the water-pressure dropped, it had to do so on a cue; and if it came back on at the right time, who knew? This was related to the new principle of physics we discovered and termed the “john Effect.” It turned out that the water pressure dropped when a critical threshold of johns was flushed simultaneously. So we locked the restrooms during the shows — only to find there were worse consequences than the intermittent blackouts! (A separate water line was the cure.) Then there was the time my co-performer, Charlie McDaniel, accidentally touched the high-voltage pass bank in the laser power supply and let out a mortal cry as he was in the process of being continuously shocked, until I reached the switch — all on cue, so of course the audience applauded.

Another afternoon in 1974, the word was out that Patty Hearst was on the lam in Griffith Park, and “wouldn’t it be fun if she showed up at the Observatory!” Now, back when our shows were completely live and our electronics were, to put it charitably, imprecise, we used Charlie’s old Navy oscilloscope to set up the “Blue Danube” scan patterns. And during that show there was a loud bang — “Patty Hearst must be in a shootout with the FBI,” and we hit the deck! Instead, it turned out to be the old scope giving up the ghost when we noticed the bad smell and the plume of smoke rising from it. But, hey, it was again on cue, and again the audience responded. Yet another unscheduled interactive moment was when a fly landed on one of the lumia pattern wheels and started to explore it, while up on the dome was the shadow of this enormous insect strolling through the projected display. Needless to say, the audience went wild! (We considered hiring the fly.)

And all that was just from the first six or eight months in L.A. — before Denver, New York, San Francisco, San Diego, Seattle, Toronto, St. Louis, London, Paris, Pittsburgh, Kyoto, Tokyo, Cleveland, Caracas — it went on and on...

It began that summer of 1974 when we first reached beyond L.A. to hit another mark — or rather two Marks — Peterson of Gates Planetarium, Denver, and Chartrand of Hayden Planetarium in New York. Our first foray into the beyond was in August at Gates where it took over six weeks and eventually our entire home staff to open (a week late).
We should have known there would be trouble when each wave of reinforcements, including yours truly, missed their flights to Denver. Then, when all was finally ready, the dome was full, the laser and electronics were functioning, and all present waited with breathless anticipation as the opening music, "Neptune" from The Planets, began. But the accompanying lumia didn't: "What could possibly be wrong now?", I wondered at the console, having duly opened the shutter. But, alas, we hadn't opened the projector cover, so in a dramatic unveiling halfway through the selection, the lumia expanded from a narrow strip to the full dome—like the earth shadow retreating at dawn—to the thunderous applause of the expectant audience.

The other openings went a little better, despite their unique challenges (no two planetariums were very much alike, especially if they were IMAX® or space theaters). An unexpected perquisite of the interest in LASERIUM® as an adjunct to regular planetarium programming was the opportunity to visit so many of them in such disparate places. And in the process I experienced a great many planetarium shows and cultivated many memories and friendships. Among the memories was a very effective staging of "The Last Question" at the Hansen Planetarium, hosted by another Mark, Littmann this time (was that particular given name some sort of unwitting advantage for applicants?). At the end of the show, when AC the Computer proclaims "Let there be light" and a truly awesome Big Bang ensues, with stars and galaxies bursting from the center of the dome amid a gigantic explosion, the entire front row of the audience arose in unison and marched out. On the other hand, my attorney, who had accompanied me, was so impressed he flew his wife and children back the next week to share it with them!

Since I spent so much time in them, planetarium seating arrangements, and especially the seats themselves, became the objects of a considerable amount of my attention. A lot of domes had tilted, high-back chairs, but the cylindrical headrests at McLaughlin in Toronto were noteworthy for their comfort, and the slightly raked concentric seating with swivel chairs at McMillan in Vancouver was unique. While the chairs at the new Sunshine Planetarium in Tokyo were very comfortable, they were quite narrow, and 'though I could fit in 1978, I might find them a bit cramped now. And the seats at the London Planetarium and the Palais de DeCouvert in Paris were even more uncomfortable then the late, unalmented instruments of the Inquisition at Griffith!

And of course there were the people—as diverse and often colorful as might be found anywhere. As far as I know, none of them had a degree in Planetarium Education, and they apparently came from an array of backgrounds, but they all seemed united in their passion for astronomy and its dissemination to the public. They were and are planetarians of whom independence and a healthy ego were prevailing characteristics; and I'm sure this had to do with the dissimilarities of their approaches and often jealously-guarded techniques, such as the wonderful and quite proprietary home-grown special effects arcana that often yielded spectacular results by singularly low-tech means (cork bottles, coffee cans and color gels, et al). Indeed, I am nostalgic for what memory recalls as those good old "Wild West" days and their chromatic cast of sun-slingers, star-tenders and Don Halls, when, in a gesture perhaps not now so readily made, many a brave celestial innkeeper allowed us (and our eventual competitors) into his or her "house of the planets" to room, as it were, much to the terror of their board and townfolk. To be sure, for some there still was the issue of the "Wrong Element": all the deranged drunks and stone lured by Led Zeppelin into their pristine planetariums to deposit bottles and butts (not the sitting kind). It was an understandable, if somewhat overstated, concern. (I remember Jack Carr reminding his board that it was a planetarium patron, not some LASERIUM® junkie, who ripped the urinal off the restroom wall to heaven knows what end!) And of course we countered that our devil-spawned rock shows actually drug in urban kids who had never seen a starry sky—not to mention the financial windfall that was the shotgun in what was sometimes an uneasy marriage, balancing on the event horizon of the institutional Mission Statement.

But it was a marriage that lasted longer than most these days, and it even birthed some latter-day evangelists like Jack Dunn in Lincoln and old friend John Hare, formerly of Bradenton, who, with his wife Linda, actually truncated a visit to the Grand Canyon on Friday and flew back to Florida, only to turn around on Saturday January 5th to be present at our closing event that night at Griffith Observatory (and he wrote a nice piece about it for The Laserist Billboard of the International Laser Display Association, from
which Linda just retired as Executive Director.

And what a night and what a week it was!

Amid the fury of that final week, before the frantic onslaught by the public—come-lately on the last Saturday (I was reminded of the Roman assault on Masada) — I was thinking a lot about how we got started and what it has meant to me and to our fans. I searched back into our archives and found a couple of things that were particularly germane to me.

In a 1986 interview I was asked of what I was most proud. And I said it was that we showed against all odds and advice that there was a mass audience for a largely abstract entertainment — that a business could be built around thinking way outside the box. (And now we’re so far outside we have to build a whole new box — the revolutionary new iteration of LASERIUM®, the CYBERDOME™, soon to appear in a nearby venue with a huge new dome and incredible interactive multimedia. We have produced a video to give a hint of what it will be like, which can be accessed on our LASERIUM® CYBERDOME™ Web page — broadband is helpful — where we hope to soon announce the exact location and expected opening date.)

I also found an unpublished essay, penned in 1973, about the relevance of our show in the planetarium. I beg the reader’s indulgence to share a portion because I think it is perhaps even more apropos today:

The planetarium has for many years vividly communicated objective scientific facts. But programs such as those at the Griffith Observatory also have provided a subjective experience of things and places that cannot yet be experienced in person. Hundreds of thousands of people rode to the moon from here on their imaginations long before Neil Armstrong even conceived he would do it. This mental teleportation to other worlds has to be called an art. It is nothing more nor less than involving people with ideas and feelings that are bigger than and far beyond their day-to-day concerns. And that is the same kind of thing we propose to do — to not only entertain, but to stimulate and perhaps even inspire the viewers to states of mind that are beyond their normal routines, and thus, hopefully, to make them richer for the experience.

Other than appearance, the thing that outwardly most distinguishes humans from other creatures is our technology. No other species has discovered and then so refined the use of tools to help with the difficult business of living. We have often misused our technology and in many ways become subservient to it, even threatened by it. Nothing should be more evident in the last half of the 20th Century than that we must restore technology to our service — to the human uses of helping us live more comfortably and more meaningfully as well. And nothing now could be more important than its use in art to rekindle wonder and delight in the midst of our darkest anxieties. Many creatures know fear. Few have the capacity for wonder and delight. They are among the most human experiences, and we must re-learn them to survive.

Certainly our anxieties have darkened even more this past year, and I think more than ever we can benefit from uplifting, creative and genuinely fun experiences that allow us to meaningfully transcend our workaday routines and even the torture and torpor of much of what passes for entertainment these days. That is what we have been trying to do these past 28 years, and it is what we expect to do more completely in the future.
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Reviews

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It’s books this time, gentle readers. Tomes. Volumes. Texts. From eggshells to nutshells—a text, a biography, a delving into and a little something for the children. Several software packages will grace the September column, and your contributions in either category are always welcome. Contact me at the address above, and see you in Wichita!

Thanks to our reviewers: Christopher G. De Pree, Robert D. Hicks, Ann Hornschemeier, Nathalie Martimbeau, Richard Monda, and John Mosley.


Reviewed by Christopher G. De Pree, Agnes Scott College, Decatur, Georgia, USA

Cosmology has been the hot topic in popular science books for at least the last decade. And there has been a recent surge of interest following the famous observations of distant supernovae that claim to show that the universe is accelerating in its expansion. The last five or so years have seen the publication of a number of well-written popular books that seek to describe (in entertaining prose) the recent developments in our understanding of the origin and evolution of the universe. A primary question about any new book on the topic of cosmology might well be, what sets it apart? Why should someone read Cosmology Revealed as opposed to The Runaway Universe by Donald Goldsmith, or Stephen Hawking’s A Brief History of Time? It is a fair question.

... all readers will appreciate the portable star maps, and a number of colorful analogies useful in explaining cosmology to the uninitiated.

Fairall’s casual, brief and often entertaining book has a number of advantages over the competition. It contains an interesting set of three-dimensional images of planets, stars and galaxies on scales ranging from the solar system to the inner shell of the “Cosmic Egg” as Fairall describes it—the cosmic microwave background that presents us with the earliest picture from the early universe. These images provide a lot of information, especially to novice astronomers who do not often appreciate the wide range in distances to visible stars. 3D goggles provided in the book decode the view of stars out to 1000 light years and the view of the Milky Way Galaxy from our perspective.

Fairall’s descriptions of familiar topics like the expansion of the universe and the recent discoveries about the accelerating expansion are approachable. The book is written very casually, as if it were not subject to a stringent editorial review. While the recent discoveries of an accelerating expansion are mentioned, for example, there is no actual description of the research, its importance, or its limitations. Most of the author’s attention seems to have been invested in the last two somewhat speculative chapters entitled “The Limitations of Science” and “The Anthropic Principle”. While well-written and entertaining, they are diversions from the main topic of the book.

I find one major error in the book, related to its title, which is the concept that one cannot “see” beyond the Cosmic Egg, that there is a limit to the time to which we can look back in the universe. This proposition is, of course, true for the passage of photons, but neutrinos and gravity waves may well be used someday to probe beyond the “veil” described by Fairall as impenetrable.

A number of custom illustrations in the book are useful, and Fairall’s casual writing style, initially off-putting, become rather effective by the end of the book. The Cosmic Egg will be of interest to amateur astronomers and the general public who have not yet thought much about the topic of cosmology. For more advanced amateurs, the level of this book will be too simple, and reveal little that they have not already heard or read about. However, all readers will appreciate the portable star maps, and a number of colorful analogies useful in explaining cosmology to the uninitiated.


Reviewed by Ann Hornschemeier, Pennsylvania State University, Pennsylvania, USA.

Donald Osterbrock’s account of Walter Baade’s life certainly has an impressive cast of characters, both in long-term collaborations and more incidental interactions.

At times Baade’s life history reads like a “who’s who” of observational astronomy in the first half of the 20th century. In Baade’s early career, for example, he participated in a
number of solar eclipse voyages, and on one of these occasions he traveled with Bernhard Schmidt. His discussions with this telescope builder about the problems of telescope mirrors and aberrations likely resulted in Schmidt’s work to develop the perfect mirror. Schmidt developed a spherical mirror with a corrector plate and the Schmidt telescope was born.

**At times Baade’s life history reads like a “who’s who” of observational astronomy in the first half of the 20th century.**

Planetaryists will appreciate Baade’s long history of lecturing, both to professional astronomers and the general public. He differed from his research contemporaries in that he used lectures and symposia to proliferate his ideas and results, rather than publishing in scientific journals. Baade was very influential and undoubtedly helped to popularize astronomy and to educate the general public about science.

The book begins with the 1920s, when the first qualitative measurements of the mysterious “nebulae” were occurring. It takes us through a real revolution in understanding. By the 1950s we see that these nebulae are galaxies and that we can learn about the evolution of galaxies and of the universe through their observation.

If one is interested in the detailed history of observational astronomy in Germany and the U.S. from 1920-1960, Osterbrock’s book is for you. It probably does not have a large amount of direct applicability to the development of planetarium programming. This book represents a monumental amount of work; a wealth of information will surely be a great resource to historians. The Composition of Kepler’s *Astronomia Nova*, by James R. Voelkel, Princeton University Press, 41 William Street, Princeton, New Jersey, 2001, ISBN 0-691-00738-1, US$49.50.

Reviewed by Robert D. Hicks, Loxodrome History Consultants, Richmond, Virginia, USA.

In the popular mind, Nicholas Copernicus redefined the cosmos from a geocentric to heliocentric framework. He did not, however, project his heliocentric model as a physical reality but offered a geometric model more palatable than the Ptolemaic alternative. Copernicus retained the concept of uniform circular motion, requiring the elaboration of circles within circles, epicycles and deferents, to account for observations.

After Copernicus came the other early greats of the history of astronomy: Tycho, Galileo, and Johannes Kepler. Kepler has attracted interest because of his achievements in placing planets in elliptical orbits, a conceptual shift from uniform circularity as significant as that engineered by Copernicus, and for describing the physical properties of these orbits. Kepler has also attracted interest because he was loquacious in print; volumes of his correspondence survive, sources ripe for analysis.

Some historians have found Kepler’s early scientific discourse difficult and idiosyncratic to follow. Kepler’s early publication, *Mysterium cosmographicum*, included a much-reproduced illustration of his conception of planetary orbits as Platonic solids, a geometrical model of elaborate and arcane construction. It is very difficult for a modern reader, even a physicist or an astronomer, to digest this image as having any accessible reality. And today, with every college astronomy curriculum anchored in physics, modern readers must be reminded that in Kepler’s day, physics and geometrical astronomy were perceived as separate scholarly endeavors.

Kepler’s *Astronomia nova* of 1609 suggested a new physical reality, uniting physics and astronomy in laying the foundation for the astronomy of Isaac Newton decades later. Pursuing the physical truth of heliocentrism as a religious goal, Kepler suggested a motive force in the sun as responsible for all planetary movement (meaning that revolutionary periods are a function of solar distance), and he also defined what have since been dubbed his first two laws of planetary motion, that orbits exist in ellipses and that planets move along elliptical orbits at varying speeds, traversing equal areas of the ellipse in equal times (now called the “area law”).

For modern historians, Kepler’s discourse in this great work appears odd in that Kepler recounted each strand of his thinking, his wrong turns, insights, false assumptions, and errors. The given historical picture of Kepler is that of an eccentric, even a mystic, who performed laborious calculations to refine mathematical prediction.

Now comes James R. Voelkel, Capabilities Manager of the History of Recent Science and Technology web project, Dibner Institute for the History of Science and Technology in Cambridge, Massachusetts, who has enlarged his doctoral dissertation on Kepler into a book. Voelkel examines *Astronomia nova*, its antecedents, and Kepler’s correspondence over many years, to argue that Kepler’s method of discourse was not eccentric, but rhetorically calculated.

**Even to a casual reader of astronomical history, Voelkel’s arguments bring the reward of peering into Kepler’s compelling but unfamiliar and unusual mind.**

Voelkel argues “that the unique conceptual and stylistic features of the *Astronomia nova* are intimately related: Kepler purposely chose this form of exposition precisely because of the response he knew to expect from the astronomical community to the revolutionary changes in astronomical methodology he was proposing” (p. 2).

Beginning with the *Mysterium cosmographicum*, Voelkel painstakingly looks at Kepler’s works and the responses they elicited from other astronomers. Throughout several years, Kepler occupied various teaching posts, was forced to move on because of his Lutheranism, received theological opposition to his ideas, and worked for Tycho as an assistant. Tycho, and virtually everyone else, tried to discourage Kepler from seeking physical causes in astronomy. Tycho assigned Kepler Martian orbital calculations, the result of which fitted Kepler’s new scheme and framed the arguments of *Astronomia nova*. Says Voelkel:

What Kepler did in the *Astronomia nova* was to make a table that acted as a bridge between his theories, and that would retain its usefulness after … a perfectly circular orbit, had been disproved. This is an excellent illustration that the *Astronomia nova* was not written as a faithful account of the research, but was crafted to instruct and lead the reader through Kepler’s various attempts. (p. 134)
Voelkel's thorough examination of Kepler's correspondence permits a compelling argument about the rhetorical structure of *Astronomia nova*. The author prefaces his analysis of Kepler's correspondence with a brief description of Kepler's intellectual milieu and the status of Copernicanism in it. The book, however, demands that the reader understand the mechanism of epicycles, deferents, troublesome equants, eccentricities, and the implications of using the mean versus true sun as a datum—concepts that may daunt casual readers of the history of astronomy.

I found the protracted quotations from the correspondence of Kepler and David Fabricius most engaging. Fabricius, amateur astronomer and pastor, provided Kepler a form of "peer review" through his letters. The reader can sympathize with Fabricius in his eagerness to see things Kepler's way, and in his inability to divorce all of the foundations of his understanding of the cosmos for the implications of Kepler's physical reality.

Because Kepler had redefined the cosmos in terms of physical properties, he knew that his rhetoric had to be clear to contemporaries so that they could not only follow his thinking, but could also see that his conclusions were inevitable. Voelkel makes a compelling case, and future studies of Kepler will have to reckon with this study.

This is a specialist work, intricate and demanding, with few formulae or diagrams, and requires close attention to the discourse of geometrical astronomy of the seventeenth century. Even to a casual reader of astronomical history, Voelkel's arguments bring the reward of peering into Kepler's compelling but unfamiliar and unusual mind.


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

Way back when Carl Sagan was starting to popularize the idea, I taught a college class on the quest for extraterrestrial life. I used photocopies of recent journal articles because I could find no suitable textbook. I would have loved to have used _The Search for Life in the Universe_. But if I were to teach that course again and use this text, I'd still need photocopies to fill in important gaps.

The book is useful beyond the college/university audience for which it is intended. A staple topic for those of us who write planetarium shows is the question of extraterrestrial life. In all polls of what planetarium audiences want to know about, ET comes out at or very near the top. And rightly so—what do we want to know if there are others like us in the vast cosmos. Or even others who are not like us.

Researching the topic is not hard. I have plenty of books on the subject and a thick clipping file—but I don't have so much excellent material in one place as is found in the 573 pages between the covers of this particular book. Whereas many other books explore an aspect of the question and go in odd directions the author has a special interest in, _The Search for Life in the Universe_ is encyclopedic, and that makes for a good reference book. There is a lot of material here on most (but not all) aspects of the subject.

The book's first section discusses the universe as a place where life might find a home. How are stars born, how do they shine, how long do they live, and how do they die? How common are planets? What do we know about pulsar planets? Where were the elements that make up our bodies synthesized? It's a good introduction, but in my humble opinion, much of this section is off-topic.


Now, half-way through the thick book, we look at the other planets in our solar system. What do amino acids in meteorites tell us? Why is Venus so different from the earth? What did Viking _really_ tell us, and is there fossil life in some Martian meteorites? Could life exist in Jupiter's clouds? At Triton's low temperature? Incredibly, the authors barely mention the question of oceanic life on Europa, Ganymede, and Callisto. As editor, I would have had the authors toss out the entire 35-page chapter on galaxies and expand the section on Europa from 2 pages to 37. Likewise, anything written about life on Titan will (hopefully) become obsolete in a few short years, but it will be a very hot topic in 2004 and 2005 and it is unfortunate that Titan was given only 4 pages.

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The final third of the book details the search for extraterrestrial intelligence. Some chapters in this section seem out of place (shouldn't the story of the discovery of extrasolar planets and a discussion of zones of habitability be earlier, under stars and planets in general?). But the essentials are here. What does Drake's Equation tell us? What is the importance of having a large moon? How would we recognize a signal from others? How might we actually travel to the stars? What do UFOs and Von Daniken tell us? And finally—a nice conclusion—why do we have to wonder over their existence (Fermi's paradox)?

Although I quibble over some serious omissions and other sections that seem extraneous, the book packs a lot of good material into one volume that should find a home on many planetarians' bookshelves.

Reviewed by Richard Monda, Schenectady, New York, USA.

Stephen Hawking has done it again. The author of A Brief History of Time and holder of the same academic “chair” as Sir Isaac Newton has brought us an update on his research about black holes, time travel and the future of the universe.

The Universe in a Nutshell begins with a discussion of Einstein, his Theory of Relativity, and the events leading up to Edwin Hubble’s discovery of the expansion of the universe. None of these are technical descriptions because this publication was written for a general audience. Nevertheless, a pro-science attitude goes a long way with the topics Hawking covers.

Hawking labels Einstein’s relativity as “classical,” a term usually used in physics to describe Newton’s almost four-hundred-year old portrait of physical phenomena. A “modern” Theory of Relativity, Hawking tells us, incorporates the Heisenbergn Uncertainty Principle of quantum physics that says we can ever exactly determine a particle’s position or its energy.

Hawking also introduces us to his personal way of thinking about science and his research philosophy: the positivist approach. Accord to this view, “A scientific theory is a mathematical model that describes and codifies the observations we make.”

In this approach, a good theory has a few basic postulates that can describe a wide range of circumstances. Further, the theory can be tested based on the physical predictions it makes. If observations confirm the predictions, then the theory is accepted by the scientific community. I the observations show otherwise, then, assuming the observations are correct, the theory has to be modified or discarded.

Notice that this approach does not tell us what the phenomenon actually is. A description with predicative abilities that can be tested is enough to perform science whether it be Newton’s account of a falling ball or Hawking’s description of the region around a black hole.

Hawking also introduces us to his personal way of thinking about science and his research philosophy: the positivist approach.

And black holes are Hawking’s specialty. The master who discovered how black holes can “evaporate” now endeavors to show that information in such an object is lost forever, not even released as the black hole dissipates. Hawking says that this has serious implications for determinism unless space stores the information as waveforms and radiates it as the black hole disappears.

This is the kind of mind-boggling concept that Hawking introduces to the reader. Other such topics include eleven-dimensional supergravity, superstring theory, M-theory, p-branes (multidimensional membranes), imaginary time and holographic encoding of a region on its boundary.

Keep in mind that Hawking treats all these concepts descriptively, carefully introducing us to his research field of theoretical physics. Hawking’s personal humor also shows through in Nutshell. Those who follow his career know that he is a fan of the television series Star Trek. Apparently the producers of the show knew as well. When he was in Pasadena, California, to deliver a lecture, he was asked if he would like to be in a scene on the image-constructing holodeck of the Next Generation’s Enterprise. No trekker would turn down such an opportunity, and there are two video stills in the book of him playing poker with Commander Data, Albert Einstein, and Isaac Newton. Hawking’s face lights up with a wide smile as he says, “Wrong again, Albert,” referring to Einstein’s well-known remark, “God does not play dice with the universe.” (Einstein did not believe in the probabilistic nature of the new quantum theory that revolutionized physics early in the twentieth century.)

Several times in the book he also pokes fun at his physical condition, claiming that his “chair” was not motorized in Newton’s time. Hawking has Amyotrophic Lateral Sclerosis (Lou Gehrig’s disease), a crippling condition in which the muscles of the body atrophy but the brain stays intact. His has reached the advanced stage; he can no longer speak and has use only of this right arm. He is now confined to his personally designed wheelchair, complete with voice synthesizer.

Finally, the title. Why a nutshell? According to Hawking, the behavior of the universe can be understood in terms of its history and when mapped out mathematically appears as a slightly flattened sphere with ridges, like the nutshell in Shakespeare’s Hamlet. To paraphrase, “We could be bounded in a nutshell and count ourselves kings of infinite space.”

This book challenges the limits of our thinking.

New On-Line Astronomy Education Journal/Magazine Announced

An international team of astronomers and educators is starting an on-line journal and magazine on space science education. Called “Astronomy Education Review” (AER), the new publication showcases educational research, innovation, resources, opportunities, and opinion.

Its web address is: http://aer.noao.edu, where more information is available about the journal’s goals. There are also guidelines for submitting contributions, and some articles that will be part of the first official issue. Articles are posted on line as soon as they are accepted, and then assembled into “issues” at regular intervals.

Astronomy is taught from elementary school through college, and is one of the most popular topics in museums and the media. NASA also has an extensive program for education and outreach. Yet astronomy has remained the only major science field with no vehicle to help educators communicate.

AER is initially being published with support from the National Optical Astronomy Observatories, and has been endorsed by both the American Astronomical Society and the Astronomical Society of the Pacific (the two main professional organizations involved with astronomy education.) Its Board of Editors and Council of Advisors has been drawn from a wide cross-section of astronomy educators at all levels. Articles, news announcements, suggestions, or avid readers for the journal are most welcome.
A fixed planetarium can use it for:

- school outreach
- workshops
- special events
- community outreach
- hands-on education

- constellations outlines can be individually projected.
- 2 sizes dome: 5 and 6 meters.
- dome color chosen by customer.
- vertical door that allows a fast, easy and comfortable access.
- lightweight dome fabric.
- 12 V DC powered.
- appropriate for schools, clubs, or an entrepreneurial business.
- can be handled by one person, fits easily into any car, sets up in 10 min.

ASTRONOMIA EDUCATIVA S.R.L.
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Jean-Michel Faidit, Aaron McEuen, Loris March. It is the first in Lorraine, and it is allocation: on the ship Queen Mary from
is also in preparation, but with a very origi­
the end of
meters, it is equipped with a French projector
simultaneously by many planetariums in
European Southern Observatory. The story is
written by Dirk Lorenzen, a German science
journalist. The show will be prepared during
the spring and summer and will be presented
written by Esteban Meneses at <estenm@yahoo.com>.

Association of Mexican Planetariums
It has recently been learned that the head of
the Astronomy Area of the University of
Sonora, Antonio Sanchez Ibarra, has been
actively involved in setting up a new astro­
omical facility at Magdalena de Kino, a
town in the northern state of Sonora. He is
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spring, with a 7-meter dome and surrounded
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rary exhibits. Its all-around low cost will
probably allow more planetariums to be
built in the State of Sonora.

Further south, in the State of Colima, a
group of entrepreneurs has been trying to
acquire a second-hand planetarium projector
to be used on a 15- to 18-meter dome. Last
time they lost a bid by a mere $500 US
to buy the old Spitz AP3 1966 model used by
the Cleveland Natural History Museum - it
sold for $18,000. If you know of someone
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The Papalote Museo del Niño in Mexico
City is on schedule to inaugurate its digital
planetarium facility after trying out several
models of digital projectors in Germany.

Canadian Association of Science Centres
The Canadian Association of Science
Centres (please note our new name) held its
annual conference 30 April and 1 May in
Calgary, Alberta. The major topics under dis­
cussion were a strategic planning presenta­
tion made by President Jim Marchbank, and
planning discussions on Federal government
funding, performance measures and the
2003 CASC conference. Additional discus­
sions focused on proposals to improve com­
munications with members, and initiation of
an awards program. A full report on the
conference will appear in the next Inter­
national News.

Representatives of the Canadian Space
Agency attended one session of the confer­
ence and presented their plans for a CSA
Educators’ Space Conference to be held at
The Educators’ Space Conference is target­
ed at science center education staff and class­
room teachers. The conference is part of a
new strategy being developed by CSA where­
by CSA scientists and engineers will be iden­
tified and trained to undertake public aware­
ness and education programs and services.
Ten workshops will be presented on differ­
ent space related subjects, all linked to the
relevant school curriculum. The conference
will also provide an excellent opportunity to
network with other educators and science
center staff from across the country interest­
ed in astronomy, space and science educa­
tion. For further information please contact
Jason Clement at the CSA. Phone 1-450-926-
4345.

A new round of funding has been announced by the International Partner­
ships Among Museums (IPAM) program. The H R MacMillan Space Centre in Vancouver
and their US partner Space Center Houston have been selected to receive one of the
awards. The citation states that “The Selection Committee found the proposal from the H R MacMillan and Space Center
Houston to be particularly strong and felt that it had the potential to produce good
results and generate lasting ties between the two institutions”. Under the terms of the
award, Pauline Landry, school programs offi­
cer for the H R MacMillan Space Centre, will
spend a month at Space Center Houston in
February 2003, with Raquel Jenkins of
Houston paying a reciprocal visit to Van­
couver in late 2002.

Three Canadian science centers were
recently awarded grants under the Gov­
ernment of Canada Climate Change Action
Fund Program. The Calgary Science Centre
will adapt the Science World Our World
exhibit to include Alberta content on cli­
mate change issues. The exhibit will run for
five years starting in March 2003, and will
co-ordinate with Alberta’s school curricul­
um.

The H R MacMillan Space Centre will

Hej Planetarian readers all over the world
and welcome to a new issue of International
News! The column is edited in mid-April, a
time when the evening sky changes quickly
at Nordic latitudes and soon won’t be seen at
all. This column depends entirely on reports
from IPS Affiliate Associations all over the
world. Many thanks to Bart Benjamin, Ign­
nacio Castro, John Dickenson, Jon Elvert,
Jean-Michel Faidit, Aaron McEuen, Loris
Ramponi, and Mark Sonntag for your contri­
butions this time. You are welcome back
with new reports, and I look forward to
reports from other Associations as well. Up­
coming deadlines are 1 July for Planetarian
3/2 and 1 October for 4/2. You may note that
I have disconnected my old fax machine for
good - but my email is as alive as ever! See
you soon in Wichita, Kansas - and hejda, as
we say in Sweden!

Association of French-Speaking Planetariums
After the CNES/APLF production last year
(La planète aux mille regards), and a point of
the study of Earth by the French Centre
National d’Etudes Spatiales, a new show is
now being prepared. It is a co-production of
ESO/APLF and the title will be: Les secrets du
ciel austral, with wonderful images of the
European Southern Observatory. The story is
written by Dirk Lorenzen, a German science
journalist. The show will be prepared during
the spring and summer and will be presented
simultaneously by many planetariums in
October.

A new planetarium opened in France in
March. It is the first in Lorraine, and it
is located at Epinal. With a diameter of 10
meters, it is equipped with a French projector
from RS Automation. Another planetarium
is also in preparation, but with a very origi­
nal location: on the ship Queen Mary II! At
the end of 2003, it will be the greatest tourist
ship on the seas. Built at the Chantiers de
l’Atlantique, with a dome of 13 meters, the
dome will be original with a circular portion
moving up, so the planetarium is included
into a more great and polyvalent show
room. We’ll come back on this event of a
new kind from the Cunard Company in the
next International News column.

For the eighth year, the annual French
planetarium magazine is edited with a lot of
papers on activities of planetariums and
astronomy. Among them are a long paper on
the Big Bang, the planetariums in Italy (with
a detailed map), and a gallery of planetarium
press, with covers of various magazines: Pla­
etarian (IPS), Twilight (Japan Planetarium
Society), GLPA News, PPA (Pacific Planetari­
um Association) and others. With the help
of advertisers and of the French Ministry of
Research, the magazine opens this year with
a new design: it is in full color. It seems it is
the first planetarium publication like that,
and thus has a kind of leadership. Finally, the
annual meeting of APLF is prepared by the
Planetariums of Bruxelles, Genk, and Ville­
euvre d’Ascq and programmed for 8-12 May.

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It has recently been learned that the head
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adapt the Montreal Planetarium’s Climate Change show into a new planetarium show called Spaceship Earth: Who’s at the Climate Controls? They will also produce a new interactive science presentation on the use of remote sensing to monitor the earth’s environment and develop a week-long EnvironFair featuring displays and programs developed by other organizations.

The Fort Whyte Centre in Winnipeg is developing a pilot outreach program which will serve students from the northern and southern parts of Manitoba learn about climate change and its impacts on their respective regions. The program is appropriately called North meets South.

Great Lakes Planetarium Association

Illinois. The Strickler Planetarium recently presented five shows to the public, which is the most they’ve ever offered at one time. These programs included The Explorers, The Explorers of Mauna Kea, Rusty Rocket, Amazing Stargazing, and Introduction to the Planetarium. Their equipment updates have continued with Ash Enterprises and the installation of an automation system.

The Cernan Earth and Space Center on the campus of Triton College in River Grove recently brought back its popular show on severe weather entitled Nature’s Fury, along with Minneapolis’ Journey to the Stars. As always, three different laser shows and a Monthly Skywatch program were also featured. On Saturday 13 April, Soviet and Russian space expert James Oberg made a special presentation to the Cernan Center members.

This spring, the Lakeview Museum Planetarium presented, among several other programs, its Saturday morning Family Show Series. John Dobson spoke at the planetarium on 3 April at the regular monthly meeting of the Peoria Astronomical Society. The Interplanetary 5K Race/Walk was held on Saturday 6 April. Runners navigated a course that took them from Mercury to Mars and back through Peoria’s Community Solar System model. The race is an official 5K Grand Prix event of the Illinois Valley Striders.

The William M. Staerkel Planetarium at Parkland College in Champaign staged in April its first big-screen science fiction film festival in conjunction with the Orpheum Children’s Science Museum. The staff recently applied for a grant for a digital sound system. Early summer will bring a welcome reupholstering of the planetarium’s 144 seats.

Indiana. The Koch Planetarium at the Evansville Museum recently hosted a “ramped up” Astronomy Day observance. Science Educator Mike Smith and Planetarium Director Mitch Luman hosted solar observing at the Museum in conjunction with local amateur astronomers, offered free planetarium shows, and presented 3-D Mars programs and Paper Plate Astronomy activities. The Museum’s scale solar system was spread out along the Ohio River walkway where visitors strolled as far as Mars (0.25 miles away) as they walked past Mercury, Venus and Earth. The outer planets were kept at the Museum.

Evening activities included neighborhood star parties and an open house at a local observatory. Peggy Motes from the Muncie Community Schools Planetarium and Amera Platt from the Wayne High School Planetarium presented two sessions at the Hoosier Association of State Science Teachers Inc. (HASTI) in Indianapolis in February. The presentations about the Cassini and Mars Odyssey missions were sponsored by the NASA JPL Solar System Educator Program and the Indiana Space Grant Consortium.

Michigan. Abrams Planetarium in Lansing recently welcomed John French to their staff. French is now their production coordinator and Digitar “guru”. On the programming side of things, they ran special shows and observing sessions around the weekends of the naked-eye planet spectacle in late April and early May. The Exhibit Museum Planetarium in Ann Arbor has completed working the kinks out of their new program, Women In Astronomy: A History, and will be making it available soon. It has received great reviews in the Ann Arbor News and the Detroit Free Press, and it was featured regionally on Michigan Radio and its affiliates. The show should be available by the fall at cost, which is about $550. This project was funded through the Michigan Council for the Arts and Cultural Affairs.

Longway Planetarium in Flint recently presented Dancing with the Dinosaurs and The Great Dinosaur Caper. They also hosted the Dinostories hands-on exhibit in their lobby. The Amusement Park Science exhibit opened on 1 June with a special feature, the Digital Amusement Park Digitar show. The Shiras Planetarium in Marquette ran Cosmic Perspective in April and May. The Kalamazoo Valley Museum Planetarium is beginning work on a new show, scheduled for a January 2004 opening. The show will be culturally focused on Hispanic traditions and celebrations, with the changing seasons as an underlying theme. Also, three summer Junior Astronaut Camps are being prepared using the planetarium and Challenger Learning Center facilities. The Digital Dome Planetarium in Detroit recently offered their in-house production Views of the Universe. Their school shows now include their own Solar System Adventure.

The Vollbrecht Planetarium in Southfield recently offered a General Astronomy and Space series made up of eight 90-minute shows on Thursday evenings. Mike Best, its sole planetarium, delivered live presentations. The Peter F. Hurst Planetarium in Jackson offered in April and May sessions for adults to learn the stars and constellations. The Cranbrook Institute of Science Planetarium in Bloomfield Hills debuted their production Engineering In Orbit: The International Space Station in May. This marked the first time Cranbrook has offered a program produced entirely in-house. Their efforts brought together an original script and music, original DIGISTAR effects, and their own 3-D video animation sequences. The Cranbrook staff offered telescope views of the spring planetary alignment. Lastly, Cranbrook welcomed Dr. James Kaler in April. He presented an exciting overview of astronomy.

Ohio. The new Shafran Planetarium at the Cleveland Museum of Natural History saw first light on 15 January at a gala opening whose guests included astronaut James Lovell and many benefactors of the planetarium. The new facility sports a Zeiss ZKP3/S star projector and immersive SkyVision video from Sky-Skan, all set under a horizontal 12.2-meter AstroTec dome. At 88, the number of seats matches not only the number of constellations but also the number of counties in Ohio, and an interactive exhibit hall introduces Ohioans and other visitors to the cosmos as they arrive for a planetarium show or linger afterwards.

At nearby Shaker Heights, Gene Zajac continues developing his recently upgraded planetarium. Student volunteers have stored dozens of AstroFx and audio clips that Gene can access during lessons. As Gene eyes further equipment upgrades, he’s also helping with a Shaker schools fundraiser by hosting a pair of silent auctions under the planetarium stars; themes have included how our cosmic knowledge has changed over time and “stars and the Caribbean constellations”. Meanwhile, a small but enthusiastic 2002 astrology club offered public skywatching programs in March and April.

Bob Martino continued his series of Friday and Saturday night public programs at the historic Perkins Observatory north of Columbus. Spring program topics included a planetarium presentation in their Computer Theater, tours of the observatory, a slide show on beginning astronomy, and/or observing with the 81-cm telescope, weather permitting. There was also a monthly series, New Vistas in Astronomy, which featured lectures by astronomers from Ohio State and Ohio Wesleyan universities.

The 18-meter planetarium at COSI has a
new name: The Dimon R. McFerson Planetarium and Theater. The name honors the board of trustees chairman who led the efforts in the building of the new COSI. The featured winter program at Youngstown’s Ward Beecher Planetarium was Astro 101, a series of live lectures about things astronomical. For a series of eight weekends, Rick Pirko and Sharon Shanks presented basic astronomy topics, from the earliest understanding of the sky above us to today’s modern space exploration. Beyond the state border in Erie, Pennsylvania, the Erie Planetarium reports that their twenty-year-old controls have been replaced with a new control system from East Coast.

**Wisconsin/Minnesota.** The Minneapolis Planetarium is holding its breath waiting for news from the Minnesota state legislature and Governor Ventura on whether or not it will receive funds to build a new planetarium scheduled to open in late 2005. Regardless, the current facility will close its doors on 1 November 2002. The Barlow Planetarium premiered a new show entitled Women Hold Up Half the Sky: Minneapolis’ Aurora show played in Stevens Point, La Crosse, and Waukesha.

**Italian Planetaria’s Friends Association**

The City of Science in Naples is the biggest science center in Italy. It contains 10,000 square meters of exhibitions including sections for kids. The space for children is equipped also with a small planetarium. A new planetarium has been opened under a dome of 9.8 meters (75 seats). At the moment in Italy there are only three planetaria of 10 meters and more. In the City of Science Planetarium, a Zeiss model, the first ZKP 3 projector in Italy, has been installed. The facility includes also a Sky-Skan All-Sky. Naples planetarium will be the first Italian dome with regular recorder shows. The planetarium coordinator is Alessandra Zanazzi <zanazzi@cittadellascienza.it>.

**Nordic Planetarium Association**

This time, there is news from some Danish and Swedish planetariums. First, Bjorn Frank Jorgensen reports that Tycho Brahe Planetarium in Copenhagen, Denmark, has just finished the reconstruction of their main exhibition. A donation from Velux Foundation of 5.4 million Danish kroner made it possible to totally rebuild the whole ground floor. The new exhibition is divided into zones containing historical astronomy, distances in space, the solar system, impacts and meteorites, the sun, the moon, the stars, cosmology, astrobiology, humans in space, instruments, and a news zone. Like many other Imax-theaters, they will premiere Space Station in late May and hope for a good summer, with too much sunshine. Jorgensen used to be a good rain dancer, but in the last couple of years the weather has been too hot and without any clouds - so he has to practice a little more this year.

Lars Petersen reports on a new show at the Orion Planetarium, Jels, Denmark. They have set up a Danish version of the Adler show In Search of New Worlds (first planetarium in Europe?). It is now playing with the local title Jagten på Nye Verden and at Orion you can have the somewhat strange experience of hearing Geoff Marcy dubbed in Danish.

Tom Callen reports that to date over 51,000 people have seen the latest public planetarium production, UFO - Sanningen är här (UFO - The Truth is Here) at Cosmonova Space Theater in Stockholm, Sweden. The show originally opened in March 2001 and features an original soundtrack score by Mark Snow, who also is known for his music for the X-Files TV series. Production is currently underway for a new children’s planetarium show for primary age students. It will use some of the same sorts of sophisticated production techniques that have been used on some of the more recent public shows to make this experience both educational and entertaining.

The next Omnimax film to open at Cosmonova will be the recently released Space Station. It includes a lot of spectacular footage both onboard and outside of the International Space Station. Set to premiere in May, ESA astronaut Christer Fugelsang will be present for the event as well as the press conference and a screening for teachers. Fugelsang is scheduled to fly on STS-116 next spring where he will participate in several space walks installing hardware on the exterior of the ISS, and he will be the first Swede in space.

Tom Callen, Cosmonova’s Astronomer/Program Producer, had his 30th anniversary in the planetarium profession in late February. He originally started at the Strasenburgh Planetarium in Rochester, New York in 1972 and was most recently at the Smithsonian’s Einstein Planetarium at the National Air and Space Museum (1978 - 1991) before coming to Stockholm to help build and open Cosmonova (1991 - present).

Ann-Gerd Eriksson has good news from Teknikens Hus, Luleå, Sweden. One day it just happened that they got three million SEK! So they closed the place for two months for renovation and building of exhibits. The reopening was on 6 March 2001. Space is the most important new exhibition area. They have chosen to focus on space activities in their part of Sweden. Kiruna, in the region of Norrbotten, is one of the largest space centers in Europe. Esrange in Kiruna gave them a Nike Orion sounding rocket. That kind of rocket is used for conducting experiments under weightless conditions. The rocket had to be shortened one meter to fit in under the ceiling. There will for sure be many launchings at Teknikens Hus - but of plastic bottle water rockets!

A big part of the exhibition is about satellites, like how we use them for communication or how they give us the latest weather reports. There are also exhibits about our own natural satellite, the moon. The planetarium has gone through an improvement with new techniques and a brighter aurora borealis. From now on, there will emerge comets, meteors, and satellites in the starry night. One connecting exhibit displays a real meteorite and a (faked) comet - but made of real snow.

With the changes in the planetarium, Teknikens Hus got inspiration for new school programs. Until now they have had more or less just one program that the educators have adjusted to the age of the audience, their wishes and questions. Now they can offer
seven different programs, each with a main theme. One of the new programs will be about the stars and the mythology of the Sami people (the Laps). They continue to keep to something that can be called everyday-astronomy, what everyone actually can go out and watch in the night sky. Finally, they got the chance to buy another mobile planetarium. The first Starlab can still be borrowed by teachers when they want to give a show in their school. But Teknikens Hus keeps the new one for themselves, for touring the region.

Eva Mezey reports that Lund's planetarium has moved closer to the Astronomy Department at the University of Lund and was placed at the bottom of an old water tower. And Per Broman reports that Broman Planetarium has delivered another Starlab Planetarium, this time to Kristianstad University in southernmost Sweden, making the number of university owned mobile planetariums in Sweden four.

Pacific Planetarium Association

The Astronomical Society of the Pacific has a revised and updated web site, where its slide sets and other non-profit educational materials now can be purchased through a significantly upgraded e-commerce site. The URL is <www.astrosociety.org>.

For planetarians, the education section of the site may be of special interest, with a variety of resource guides to topics in astronomy, such as:
* Good hands-on activities on the Web.
* Environmental issues and astronomy.
* Women in astronomy (including information on the lives and work of 36 women astronomers of the past and present).
* Debunking astronomical pseudo-science.

The Reuben H. Fleet Science Center in San Diego, California, has been installing a show called Behind the Dome, a sort of "how we do it" look at the nuts & bolts of a planetarium. They are also updating a show called The Flying Blue Marble, a fast-paced look at the many motions we are experiencing here on Earth. Narrated by Tom Kane, it features a Monty Python song called The Galaxy Song from their film The Meaning of Life. Narrator Kane has a style of delivery that closely matches Eric Idle of the Monty Python group. The story, written by astronomer Dennis Mammana, begins with a traffic jam. Local traffic reporter Monica Zeck announces "You're not going anywhere!" The narrator soon corrects that misconception with an explanation of just how fast and in how many directions that traffic jam is actually moving. Digistar programming and conversion of the MC-10 programming to the new R. A. Grey System I is being handled by John Young.

Karl von Ahnen Minolta Planetarium at De Anza College in Cupertino, California.

Rocky Mountain Planetarium Association

The Air Force Academy Planetarium, usually referred to as the Center for Educational Multimedia, may be in for yet another name change as they realign their mission for Cadet instruction to become a Space Operations Laboratory. They will still offer school and public planetarium programs, but will be involved in demonstrating the concepts of command and control in space operations, teaching and demonstrating how space assets can be used to support U.S. interests around the world. It is with this mission that they are looking to a future installation of some sort of full-dome projections system with real-time operations and interactivity.

On 7-8 March, Mueller Planetarium at the University of Nebraska-Lincoln, was the site of two concerts featuring classical music composed by astronomers. A chamber orchestra under the direction of UNL doctoral student (in conducting) Benjamin Carlisle played in the front of the planetarium theater. One complete row of seats was removed and the next row blocked off to get the fourteen string musicians and one harpsichordist into the area. Players were students in the UNL school of music, while UNL Physics and Astronomy professor Martin Gaskell played the harpsichord. Two of D. Gaskell's compositions were part of the concert. There were also two of William Herschel's symphonies on the program. One other astronomer represented was Russian astronomer Valentina Dorenchenko. In the end, both concerts were sold out five days in advance.

Arizona Science Center just finished a series of successful informal adult astronomy classes, giving lectures loaded with images and Digistar simulations on black holes, constellations, cosmic catastrophes, and our search for new planets. They are working on a modified version of an older Mars show for the summer, along with a new mini-show, Sizing Up the Galaxy. They are also finishing artwork for three short children's stories and they hope to make the stories and artwork available to other planetariums this summer. Anyone with questions should contact Christine Shupla at shuplac@azscience.org or (602) 716-2078.

The Taylor Planetarium at the Museum of the Rockies in Bozeman, Montana, has received a grant from the Montana Space Grant Consortium to develop a program...
using the Lewis & Clark expedition as a parallel for the similar challenges of exploring and colonizing space. The program is expected to be completed in 2003; project plans include making the program available for distribution.

In 1965, Salt Lake City's turn-of-the-century public library building was renovated to become Hansen Planetarium. After 37 years of star theater programs and astronomy presentations in a building that was never intended to house a planetarium, they are moving into a brand-spanking-new facility.

Last October, after many months of careful planning and analysis, Salt Lake County, Hansen Planetarium's parent organization, approved a bond for the construction of a new planetarium in the recently completed Gateway district of downtown Salt Lake City. The structural steel and concrete is already completed and most exterior walls are in place. Interior construction begins in late April and the new facility is scheduled to open in late November of this year.

The Minneapolis-based architectural firm of Hammel, Green & Abrahamson has designed a beautiful 4,650 square meter facility. In it will be featured some impressive technology and attractions, including a 3-D flat-screen Imax theater, 1,000 square meters of astronomy and space-science exhibits, 900 square meters of staff office and production space, and a state-of-the-art star theater featuring the latest Evans & Sutherland real-time computer graphics projection system.

The new star theater is the first Evans & Sutherland Digistar 3 projection system. The D3 is a major advance in star theater projection technology. The new 17-meter dome (12 degree tilt) will feature a "pitless" unidirectional seating layout. An additional ten seats are gained in the middle of the theater and eliminate the noise and visual distractions of equipment in the center of the room. Everything the D3 projects, from its real-time computer graphics to its color star field, originates from six high-resolution video projectors that are barely visible on the cove. They will be able to present both linear playback star shows and give the audiences live star lectures featuring audience interactivity and on-the-fly high-resolution computer imagery and color 3-D star fields.

The staff has already begun the process of converting The Secret of the Cardboard Rocket into a full-dome video format, and they look forward to producing one of their own!?
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On April 12, NASA Administrator Sean O'Keefe unveiled the future direction of the agency.

The NASA Vision is:
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To find life beyond.

The NASA Mission is
To understand and protect our home planet
To explore the universe and search for life
To inspire the next generation of explorers
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As you can imagine, those of who do education and outreach for NASA are excited about the emphasis on education. All of you are very important in inspiring the next generation of explorers, and our IPS partnerships are an important link.

We are looking forward to meeting many of you at the IPS 2002 conference in Wichita. On Sunday, April 27, several NASA workshops will be provided for both planetarians and local teachers. For planetarians, Dr. Cheri Morrow, Space Science Institute, Boulder, Colorado, will present an interactive three-hour workshop on “Searching for Signs of Life in the Solar System and Beyond.” Also for planetarians, one-hour workshops will be presented by the Sun-Earth Connection folks including their “Best of Eclipse” Video and Northern Lights Planetarium Show and by representatives from the Mars program. For teachers, the opportunities include “Hubble in the Classroom;” Sun-Earth Connection classroom resources, including CD-ROMs, lesson plans, The Reasons for Seasons and Living with a Star GEMS Guides from the Lawrence Hall of Science Great Explorations in Math and Science and NASA; “Ways of Seeing,” by the Cassini mission, and the Mars Student Imaging Project.

NASA Space Science folks will also be present in the exhibit area, and we urge you to stop by, meet the broker/facilitators for your area of the country, and talk about ways to collaborate. Speakers during the conference will include Dr. Jeff Rosendhal, assistant associate administrator for education and public outreach in NASA's Office of Space Science, and Dr. Carolyn Porco, leader of the Cassini imaging team. Astrophysicist Dr. Alan Dressler, from the Carnegie Institute in Washington, D.C., will be the banquet speaker. Dr. Dressler maps the distribution of dark matter by tracing the velocities of galaxies that are affected by its presence. By finding the peculiar velocities (motions that are in addition to the expansion of the universe) of thousands of galaxies, Dressler and colleagues discovered a huge concentration of the material, which they named the Great Attractor.

If you haven't yet discovered PlanetQuest, give it a look. The website created quite a buzz when unveiled in January at the American Astronomical Society’s winter meeting. The URL is http://planetquest.jpl.nasa.gov. The site is devoted to the search for extrasolar planets, and is highly interactive. Over the next 15 years, NASA is embarking on a bold series of missions to find and characterize new worlds. These will be the most sensitive instruments ever built, capable of reaching beyond the bounds of our own solar system. They include the Keck Interferometer, Starlight, Space Interferometry Mission (SIM) and Terrestrial Planet Finder (TPF).

In honor of their 25th anniversary, the website for Voyagers 1 and 2 has also been given a new look. Check it out at http://voyager.jpl.nasa.gov and let us know what you think.

The countdown for the scheduled July 1 launch of the Comet Nucleus Tour (CONTOUR) mission is underway. The mission website is at http://www.contour2002.org. The spacecraft will encounter Comet Encke in November 2003. Three Earth-swingby maneuvers will then target the spacecraft for an encounter with Comet Schwassmann-Wachmann-3 in June 2006.


A good place to keep track of all NASA space science missions is at http://space-science.nasa.gov/missions/index.htm, curated by Craig Tupper at NASA's Office of Space Science. Craig also posts headlines at the top page at http://spacescience.nasa.gov.

A recent forum/broker/non-profit event illustrates the collaborative power of the NASA Space Science Education and Public Outreach support network. First the background: Last summer, at the American Astronomical Society's meeting in Pasadena, California, a new book for the visually impaired was presented. The book, Touch the Universe, was commissioned by Bernhard Beck-Winchatz, associate director of the Space Science Center for Education and Outreach at DePaul University. (DePaul is one of NASA's Office of Space Science E/PO Broker/Facilitator organizations.) Noreen Grice, an education associate at Boston's Charles Hayden Planetarium, created the book, which combines images from Hubble, tactile representations of those images, and text printed both visually and in Braille.

Students at the Colorado School for the Deaf and Blind tested prototypes under the guidance of Benning Wentworth, a science teacher at the school. When AAS press officer Steve Maran saw the abstract for a paper by Noreen, he picked it as a press release opportunity.

A local Southern California resident, Shari Fleischman, saw the AAS press release and was inspired to start a non-profit organization now called The Accessible Outdoors, which makes outdoor experiences more accessible to those with disabilities. Her first venture would be a star party for the visually impaired. Through the JPL Media Relations office, Shari was directed to me, and I directed her to Noreen, to JPL's astronomy club, to Dr. Cass Runyon (NASA's broker/facilitator in the southeast U.S.), and to the Mt. Wilson Institute. And this spring, on March 17, the first star party was held. Unfortunately, weather conditions at Mt. Wilson were not good, so the event was moved to the Jet Propulsion Laboratory. Steve Edberg and Ron Braakle of JPL's astronomy club (and outreach community) provided a scale model of the solar system and a meteorite collection.

Dr. David Hurd, planetarium director and astronomy professor at Edinboro University; Edinboro, Pennsylvania, brought special tactile maps and materials for everyone to touch and learn from. Cass Runyon came from South Carolina to support the event. Ms. Fleischman also obtained support from several local firms and organizations.

I believe this is what “brokering” is all about: making connections between folks to make good things happen, and to inspire the next generation of explorers.
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One of the great things about being a planetarian is the feeling that we are really a part of the international community. Through the magic of this wonderful machine that we are able to play with, we can travel anywhere around the world and share our educational expertise with others doing the same profession. The people we meet have to be the best in the world. This has been reinforced by a report by international education editor Marie Rådbo, who sends in this report:

My child has been adopted
by Marie Rådbo, Gothenburg Mobile Planetarium
Department of Physics and Engineering Physics
Chalmers University
SE · 412 96 Gothenburg, Sweden
radbo@fy.chalmers.se

For 20 years this planetarium had been part of my life, but now the end had come. The planetarium, which almost has become like an extra child to me, now had been adopted. Now the time had come for the long journey, and hopefully both of us were well prepared. Tomorrow we were leaving for its new home - South Africa.

When my Starlab-child arrived in Sweden it was all alone in Scandinavia. But today there are several planetariums like mine. During those years, hundreds of thousands of children have had the opportunity to make friends with my child. The first years I traveled all over Sweden myself, but after that I have also taught others how to use it, and I have more and more become an organizer of these activities myself.

I still remember when my planetarium arrived in Sweden and will never forget my own thrill the first time I saw it in action, a similar thrill which I have noticed the children also feel when they enter the dome. I have also found, like probably everybody else in the world working in this field, that this is an experience the children will never forget. Indeed it has been most awarding working with this planetarium.

But now it was time for a change. I had been invited by FEST, the Foundation for Education, Science and Technology in South Africa, and of course I felt very honored to go there to share my experiences. I had decided to bring my planetarium and to leave it with them. Although the Swedish children still want to see it, I had made up my mind. It would be healthy for my 20 year old planetarium to move away - like all children need to do when they get old enough.

Of course a lot of preparations had to be done before leaving. South Africa for example has another starry sky, and as an astronomer I did know, but still I got into problems which I had not thought of in the first place. To start with I needed a new cylinder, and that was an easy task. But then I became aware of that I could not change the direction of the rotation on the projector. Thanks to Learning Technologies this detail also could be solved. They promised to send a Southern Hemisphere motor, which was supposed to leave for Sweden September 11. For natural reasons it was delayed, but still I got it in time to install it on the projector. The only thing that now remained was to learn the Southern sky, and therefore I spent several hours in the darkness of our bedroom practicing these stars. Of course my husband wondered what was going on.

Next morning at the airport I got into new problems, and this time with the custom proceedings. However, at last I managed to get all my luggage through without any extra cost! Next day we landed in Cape Town and once again I was reminded how convenient it is to travel south-north instead of east-west.

During my two weeks in South Africa everybody made me feel very happy and comfortable, and all the time I met both learners and teachers. In Cape Town I stayed a couple of days with Dr. Mike Bruton at the newly opened MTNsciencecentre, and I also visited professor Tony Fairall at the S.A. Museum Planetarium. He and his family also kindly invited me to their new weekend house in Simon's Town, a charming place along the coast, which I enjoyed very much. I also got the opportunity to see different outreach program in action as well as I was fortunate to exchange ideas with lots of people from different organisations. I gave public talks and the last days I was also honored to be invited to the SAASTEC, South African Association of Science and Technology Centres, conference as keynote speaker. My trip ended with a safari for two days when I was lucky to see four of The Big Five, all except a lion.

When leaving for Sweden again I felt convinced that the people in South Africa will take good care of my baby, and of course I will be happy to support the new parents as much as possible. At the same time I felt very strongly that my child always will be part of my life. In my heart I will always be a planetarian.

In this column we have been looking into the educational services of the individual planetarium organizations. This time, Dave Maness, President of the Southeast Planetarium Association, informs us that SEPA doesn't have a structured education committee, because so many members are doing so much in the line of education that they don't feel the need for an actual subset within the organization. As persons who went to the combined SEPA-GLPA meeting last summer in Kentucky, we can vouch for the educational programs coming out of that region.

Sri Lanka

In our ongoing report from those members who traveled to Sri Lanka in 2001, Kathy Michaels gives these memories:

Sri Lanka remains on my mind as a pleasant memory and an unforgettable experience. I have shared memories and photos with friends and relatives the past year and made many of them want to go to Sri Lanka, too. Over the past year I have made an effort to collect my duplicate astronomy lesson materials and several new books to send to the planetarium in Colombo. But, one package won't be enough: We all need to reach out and share our expertise and materials, not only with Sri Lanka, but with other countries in need. My hope is that the summer of 2003 will bring another conference and adventure of sharing and learning in astronomy education and world friendship and peace.

As an adjunct to Kathy's note, the MAPS Education Committee is asking all who attend this year's conference in Worcester, Massachusetts to bring a book with them to send to Colombo. We will report in the next issue on the results.

The reward of writing is not the transfer of information, but the personal discoveries and insights that occur during the process.

- F.M. Forester
President's Message

Martin Ratcliffe
Exploration Place
300 N McLean Blvd
Wichita, Kansas U.S.A.

IPS 2002

It's conference time for IPS. By the time you read this, we will be meeting, or about to meet, at Exploration Place in Wichita, Kansas, U.S.A. for IPS 2002. The meeting runs from July 28 to August 1. The 2002 conference is the first in the United States of America since 1994. I look forward to seeing many of you there. The theme is "New Explorations".

Our professional calendar revolves around our biennial conferences. It's an opportunity to meet old friends, and make new ones. It's a unique opportunity to re-charge the batteries, generate new ideas, create new collaborations, and inspire a new generation of planetarians. It's an opportunity to hear about how different cultures tackle a range of challenges that arise in our profession. It's a time to meet old friends, and make new ones. It's a challenge and a wonderful opportunity. Planning requires three years (gosh, I had a whole 8 months for this year's conference), and while the work is hard, some of it thankless, the benefits are many. Please consider bidding for 2006, and begin to look forward to having the planetarium profession visit your city and institution.

NASA at IPS

Following a great deal of work by a number of people, I can confirm that the conference will include workshops designed specifically for planetarians. These workshops will be held on the Sunday afternoon at the Hyatt hotel prior to the opening reception. In addition, a special presentation by Dr. James Rosendhal, head of the Education division at NASA headquarters, will speak to the membership. This presentation is particularly timely, since the new NASA Administrator, Mr. Sean O'Keefe, has recently announced that a NASA priority is to provide higher quality educational experiences. Since many of NASA's materials are made available over the world-wide web, such advances to our cause benefit planetarians around the world. I'd like to thank Anita Sohus at the Jet Propulsion Laboratory for her continued support of IPS activities. In addition to coordinating the workshops for the IPS 2002 conference, Anita supplies IPS with video material (IPS Video disk 2 - still available), and recommends images for distribution in our slide service.

Slide Service

Those of you signed up for the slide service may have already received the next batch of slides as part of your subscription. There is a magnificent collection of slides, including new images from the Hubble Space Telescope and from Mars Odyssey, plus many other sources. We now have a smooth operation for the slide service, and my thanks to all those who make it work. If you are not signed up, make sure you do for the next period of subscriptions when the time is announced.

IPS Conferences – 2004, 2006

In 2004 we will meet again in Valencia, Spain.

Invitations to host the 2006 conference are still being accepted. Bids will be reviewed at the 2002 conference in Wichita, following which details of each bid will be discussed at the regional level. The final vote occurs at the 2003 IPS Council meeting.

Hosting a conference is a tremendous challenge and a wonderful opportunity. Planning requires three years (gosh, I had a whole 8 months for this year's conference), and while the work is hard, some of it thankless, the benefits are many. Please consider bidding for 2006, and begin to look forward to having the planetarium profession visit your city and institution.

Strategic Planning

Our strategic planning initiative is naturally taking much longer than planned. In my last message I said I would report on the developments. John Dickenson and I completed his work on the proposal and it. Discussion will continue. In order to properly plan for the next five to ten years, we need to spend some resources on the task, utilizing talented professionals in the process of strategic planning. If done carefully, IPS stands to gain far more than it spends. However, attaining the longer view is a challenge, one that I hope we will step up to meet. However, there is no rush into a process that may take five years or more to develop. It's at times like this that I understand the challenges of piloting a large oil tanker. I hope that I can instill some momentum to the discussion. The goal is to provide a continuing improved and high quality service to our membership.

Special Thanks

Thanks go to Gary Sampson, retiring chair of the Education Committee. Gary began this new committee under Dale Smith's tenure as President, and Gary set up an excellent committee. Earlier this year, Gary announced his retirement both from his job and from the IPS committee. He leaves the committee at the end of the IPS 2002 conference. I'd like to take this opportunity to give a heartfelt thanks to Gary for his excellent work with the committee, and wish him well in his retirement. I am pleased to announce that April Whitt will take over as Chair of the Education Committee, and may of you will, I hope, get a chance to meet April at the Wichita conference this summer.

This message is shorter than usual, and I think you will understand - I have a conference to organize, and I also hope more people will read the shortened edition!

The final deadline for the September issue is July 21.
New advertisements should be received by July 14.
sur bri: ghness was finished in 1929. Dutch astronomer, Antonie Pannekoek used equipment now found in museums. Even the most accurate reference atlases available today, like Wil Tirion's Sky Atlas 2000.0, must rely on this less-than-current data. At best, only four levels of brightness or isophots are imaged and the spectral sensitivity of the human eye goes unaccounted for. Enter Dr. Axel Mellinger of the University of Potsdam. Using specialized tracking cameras and Kodak film, Mellinger recently took SI wide-angle photos of the entire sky in both the northern and southern hemispheres. Each image was created in a 30-45 minute exposure and then digitized. The entire sky was digitally stitched together in a giant, highly-accurate 300 MB computer file. Dr. Mellinger's beautiful all-sky panoramas are available through Sky Publishing (http://www.skypub.com). This dataset has become the basis for Starlab's inclusion of the Milky Way in their star projector.

The Starlab planetarium has held back on a realistic depiction of the Milky Way in the past, deciding only to show the outlines on its Celestial Coordinates cylinder. With Dr. Mellinger's data available, Learning Technologies contracted with him to produce a special dataset that conforms to the demanding cylindrical projection required in the Starlab. This image is added to the starfield in proper registration using a specially created set of half-tone screens designed by LTI's James Roderick and Dr. Philip Sadler. Employing eight levels of brightness arranged in accurate contours and a special high-density screen to smooth isophot edges by light diffraction, the Milky Way is merged with the starfield without any need for additional projection devices. Cylinders with Milky Way images simply replace the older starfield cylinder. The Milky Way projection is highly accurate in both brightness and location. One can easily pick out features like the Coal Sack and the Milky Way's center, as well as the nearby Large and Small Magellanic Clouds, adding to the precision of Starlab's recreation of the night sky. The new projection will be demonstrated at the July 2002 IPS meeting.

Papers and Workshops for Portable and Small Planetariums at IPS 2002

The portable planetarium community will again be making several presentations at the IPS Conference. Following is information about papers and workshops that will be presented in Wichita.

Astronomical Interactive Exhibits
Lars Broman and Per Broman (Dalarna University, SE 791 88 Falun, Sweden, lbr@du.se, pbn@du.se)

It has been shown (Franck Pettersen, Master thesis 1995) that a planetarium show has a much larger educational impact if it is accompanied by hands-on experimenting. In this paper, a number of interactive exhibits that we have used together with Stella Nova Planetarium at Falun Science Center and at Teknoland will be presented: Quattro Stagioni; explains the seasons. Orbiting Moon; explains the lunar phases. Recognize the Constellations; manipulate a star chart with LED stars whose color can be changed. Kepler's Dance; experience Kepler's three laws of planetary motion, walking in pace with Walking Tune from Appelbo (Lars Broman, Planetarian 1/2002, p. 27). Walking on the Moon; experience 1/6th of the gravity at the surface of the earth. Astronaut Scales; weighing with swinging springs. Yourself a Sun-Dial; where you stand gives the time. Teknoland's Solar System; experience the sun, the planets, and the planetary distances in the scale 1:10 billion.

Communicating Science - New Course at Dalarna University
Per Broman and Lars Broman (Dalarna University, SE 791 88 Falun, Sweden, pbn@du.se, lbr@du.se)

Following six years of courses in science center education and inspired by a Master Program on the subject in Cardiff, Wales, we started a new one-semester full-time course in Communicating Science at Dalarna University in the fall of 2001. The new course consists of four parts: Science and informal learning, Interactive exhibition, Planetarium program, and Individual project study. Languages of instruction are Swedish and English. During the planetarium program part, the students will learn how to make audio-visual programs for small and portable planetariums; a typical program will fit on a CD and is shown using a computer and a computer projector. Among project studies chosen by students in the courses of this academic year, several deal with planetariums: what program subjects that school children prefer; what they learn from Starlab visits; and how teachers and pupils grade such visits. A continuation course will start for the first time in coming fall.

Astronomy Concepts Appropriate for Different Ages
Jeane Bishop, Westlake Public Schools Plan-
Research, including my own, indicates that topics we present in the planetarium and the classroom are not understood at the ages we expect. Both maturation and experience seem to be important for understanding of particular concepts. In this workshop, I will demonstrate examples of what is appropriate and what is not appropriate for the majority of students at a particular level. I will emphasize what Piaget has termed "projective spatial ability," the ability to connect two or more perspectives for understanding of a concept. Projective spatial ability is important for full understanding of such basic concepts as the seasons, lunar phases, and planet motions.

Science Olympiad Astronomy Events - Preparation and Testing
Jeanne Bishop, Westlake Public Schools Planetarium, jeanbishop@aol.com
Science Olympiad is a school-based competitive activity whose popularity is growing in the USA. The event should involve use of a planetarium, and the portable planetarium is ideal for aspects of preparation and testing. In this workshop Science Olympiad and the astronomy events will be explained, and methods for preparation and testing will be demonstrated.

The Starlab Week in Italy: A Chance of a Lifetime
Loris Ramponi Osservatorio Astronomico Serafino Zani zani@serafinozani.it and Susan Reynolds Button OCM BOCES Planetarium sbutton@ocmboces.org
Since 1995, at the end of October each year, Serafino Zani Astronomical Observatory (Lumezzane/Brescia) hosts an American planetarium operator who presents lessons with Starlab to high school students of English, elementary students (Space Program), teachers, and new Starlab operators. This program is made possible through collaboration with the IPS Mobile Planetarium Committee and with the support of Learning Technologies, Inc. Transportation from the United States is provided, along with bed and meals during the week. During the 2002 "Week", with support from the Italian representative of Carl Zeiss, free workshops for Starlab operators will be organized. Six American teachers have experienced this unique opportunity. To view images of participants involved in the program visit this site: www.cityline.it/cult/zani/astro_bs.htm.
An itinerary of the week is also described, through a list of images, at the Internet site: www.cityline.it/cult/zani/astro.bs.htm. Participants will have some free time to explore Brescia, which is very rich in the area of public astronomy. There is a collection of old astronomical instruments (astrolabes, celestial globes, clocks) exhibited in the main history Museum of the city, a XIX-century painting of astronomical interest inside the Art gallery, a XVI-century astronomical clock in the main square of the city, four small planetaria and two public observatories between Brescia and Lumezzane.
The area around Brescia is also very interesting for its natural landscapes and parks, three lakes and a most important valley for prehistoric age stone engravings. Important artistic cities, such as Verona and Venice, are nearby and can be reached by taking a one or two-hour ride by train.

SPACE: Starlab Program of Astronautics and Cosmic Exploration
Loris Ramponi Osservatorio Astronomico Serafino Zani zani@serafinozani.it and Susan Reynolds Button OCM BOCES Planetarium sbutton@ocmboces.org
This workshop will be about "SPACE," which is the name of a Starlab program, for elementary school students (8-10 year olds). It is designed to simulate a space trip in a classroom or a planetarium. This program involves students, teachers and parents in a unique way:
1. Students are introduced to and research the following topics: the basic "geography" of the cosmos (from the solar system to the galaxies); how our planet appears from space (earth images taken by satellites); what happens with common objects in conditions of microgravity.
2. Students create projects (models of artificial satellites or a spaceship; original images about imaginary alien worlds; drawings of common objects floating in the spaceship).
3. A presentation is given using six different Starlab cylinders (Earth, Transparent, Deep Sky, Solar System/Milky Way, Greek mythology and Native American mythology) and student created materials.
4. The materials developed during the program (artificial satellites, tunnel, drawings, homemade slides etc.) are shown to the children's parents in a school exhibition at the end of the school year.
5. An evening sky observation session is held during the last days of the school year. This time with students and parents will be devoted to the observation of constellations and then artificial satellites.

Instructional Support Services for Science Education
Susan Reynolds Button, OCM BOCES Planetarium sbutton@ocmboces.org
The Onondaga-Cortland-Madison Board of Cooperative Educational Services (OCM BOCES) has an instructional support division called the Math-Science and Technology Center. This center provides services that enhance the teaching of mathematics, science and the use of technology in our component school districts. One focus of our services includes training teachers in Space Science Education. Through our kit program, we also provide a comprehensive teacher guide and the materials necessary to present each lesson to students. Then a specialist brings a Starlab to each school at a time they request. The kit program prepares teachers and students so that their planetarium experience is an integral part of the curriculum in each school.

Starlab Workshop: Starting, Selling, and Restarting Pegasus Productions
Dayle Brown, Pegasus Productions
I guess I'm just hooked! In 1991 I started Pegasus Productions, an astronomy education business serving schools, libraries, museums, etc., using a souped-up Starlab. I loved it, but decided to go back to the classroom for the insurance and retirement benefits. In 1994 I decided to sell all my equipment due to wear and tear, unreimbursed by my school district. This year I retire from the classroom with full pension. As my abstract goes to press, I will be getting my brochure mailing sent off. By the time we meet for the IPS Conference, I should be up and running with all "new" equipment. Cross your fingers for me!

Story Telling in Starlab
Dan Rosen, Western Sky
Planetary story telling is an integral part of the planetarium experience. The retelling of many ancient mythological legends can be a wonderful way to show how humans have always sought connection between themselves and the earth and sky. For this workshop I would like to share some of my favorite stories such as the Kiowa legend of the origin of Devils Tower and the Big Dipper. I will also tell some Navajo and Shoshone stories of the sky using the Starlab Native American cylinder. I will also present the "million mile millimeter" which is a story/demonstration I use with middle and
high school students to help them begin to comprehend the length of a light year and the distance to the stars.

Corrections
It was brought to my attention that there were some errors in the column last month. I apologize for that! Section V of the IPS Portable Planetarium Handbook 2002 has the latest information on all the models of portables.

The entry for the RS Automation products was incorrect.

You can contact them at:
R.S. Automation Cosmos, Rue des Mineurs - Z.I. de la Vaure, B.P. 40 - 42290 Sorbiers, France; telephone: +33 (0) 4 77 53 94 94; fax: +33 (0)4 77 53 38 61; email: sales@rsacosmos.com; website: http://www.rsacosmos.com and/or

MMI Corporation, 2950 Wayman Parkway, PO Box 19907, Baltimore, MD 21211 USA; telephone: 410 366 1222; fax: 410 366 6311; email: mmicorp@aol.com; Website: http://www.mmicorporation.com

This company has an updated portable planetarium, Cosmodyssee III, just to mention a few of the improvements: it has a halogen projection lamp, 1535 stars with a Milky Way and 10 Messier objects. Both this product and their Roving Star planetarium on a trailer specifications can be found in Section V of the Handbook.

GOTO has a new USA and Canada Liaison Office: Ken Miller, 1525 Bernice Street, Honolulu, HI 96817-0916 USA; telephone: 888-847-5800 (toll free in USA) or 808-847-5800 (in Hawaii); fax: 808-847-5850; email: gotousa@earthlink.net.

More Portable Dome and Projector Manufacturers Found
In my search for information to put in the handbook, I ran across several interesting new developments in the manufacture of domes and projectors. Here's what I found that was new to me. See pictures and more detailed information about these models in the Handbook, in Section V.

Gambato Projectors - (Gambato, via Martiri della Liberta, 100, 30038 Spinea, VE; telephone: 041 583 01 45; email: gambato@mpnet.it) Website (this site is in Italian only): http://www.gambato.com/index.htm I knew Mr. Gambato produced projectors, with individually lensed stars that create a very beautiful sky. Now he makes portable models.

Holmestronic - John Holmes, 106 Eden Ave, Wayfield Estate, Chatham, Kent ME5 OHP United Kingdom; phone: (0)1634-301898; email: holmestronic@aol.com.

Dennis Ashton told me that he uses a Holmestronic projector. He also says that the maker, John Holmes, devised the electronics for the Greenwich time ball. I contacted John to see if his projector is on sale to the public.

John Holmes says he is now prepared to put his projector on the market. Here a few comments he made about his projector:

Fully compatible with Starlab cylinders (John does not sell cylinders.)
Brighter than other current models
Complete immunity to mains voltage variations
Variable speed drive
Reversible for southern hemisphere projecting
Built in emergency house lights in case of power cut
3,000 hours bulb life
Quick-change bulbs (about one second)

Pliandroid - Saúl Grijalva (Guaymas, Sonora Mexico. Websites: (Spanish only) http://cosmos.astro.uson.mx/procons.htm and www.geocities.com/grijdvlv). Mr. Grijalva has produced a homemade projector by combining a digital photographic technique with a dodecahedron design. By using a digital photo technique, he has incorporated the Milky Way into the starball itself. This design has been accepted by the local State University who plan to create a small planetarium in each of the towns in their state. It is not for sale publicly at this time but it will be for sale in the future.


I had heard about the prototype of this system at the 2001 GLPA/SEPA conference last June. It has now been unveiled and was shown in one of Ray Worthy's special domes.

It is the world's first full-color digital planetarium. Basically it is a computer all-sky projection system. It is "portable" (two people) so can be used at remote sites for outreach. Additional details about the MEDIA-GLOBE can be found at the website: www.MEDIAGLLOBEPalianetarium.com. This system will be demonstrated at IPS 2002. I am interested to see how this type of projector may revolutionize the small dome world.

Megastar - As you all probably know, Takayuki Ohira (email: oohira@j2.so-net.ne.jp; website (Japanese and English): http:// www02.so-net.ne.jp/~oohira/index.html) developed a homemade ultra high performance planetarium projector called Megastar. This system is not currently for sale but rumor is that it may be soon! The European and USA Representative is Bill Gutsch. You can contact him at 102417.2073@compuserve.com.

Sphaera - Albert Pla is executive director of Aula del Cosmos, a company from Barcelona, Spain. He wrote to say, "We have been working on the development of the "Sphaera" system based on a portable dome. Our inflatable dome is light, versatile and quick to assemble, produced by the Quim Guixà's company in Barcelona (we are his representative). We have been selling 23 domes of this model all around the world in the last 3 years ... In Newark there is one of our domes.

Recently we have developed a new dome with arches. It's a revolutionary design! The door can be permanently opened during the enter and exit of the audience. So, it is very comfortable to persons of all ages and handicapped people to enter and leave the dome. The audience can also comfortably lean against its walls as the other model. Domes can be made in different sizes (in meters): 380, 400, 460, 500, 580, and 675." I probed further and he continued, "Unfortunately, I will not be present at the IPS 2002 ... but I will bring my domes to the International Meeting of Portable Planetariums in Belgium this May. In fact, the new arches dome is yet a prototype. Surely, the definitive model will be finished this year's end (some improvements and details). The arches structure is a revolutionary concept that we are sure will bring a lot advantages to our portable planetarium's world."

I really look forward to seeing his new dome design in person, as the picture looks beautiful, somewhat like a hot air balloon! Albert is also selling his planetarium projector now.

Stargazer Domes - Ray Worthy (Stargazer Planetariums, 5 Elmwood Place, Hartlepool, TS26 0LE, United Kingdom; email: raymond@stargazer.demon.co.uk; website: http://www. stargazer-planetariums.co.uk/index.html; http://www.stargazer-planetariums.co.uk/index.html continues to make improvements and has a new lightweight model. The beauty of his domes is that the customer can choose which size to order and at what height the horizon should be.

Starry Night Planetarium - John Mosley tells me that Starry Night Planetarium is due out early in 2003 with the first installation at
the Griffith Observatory Satellite facility (they will be presenting school shows from a temporary facility while their main building is being renovated) in Los Angeles. This new software, projected through a 180-degree fish-eye lens, features over 20 million stars, 3D voyages, and beautiful, fast graphics. The folk from Starry Night will provide a preview in Wichita. Contact Tom Andersen (tandersen@starrynight.com) or John Mosley (jmosley@GriffithObs.org) for information.

**StratoSphere** - Stephen Harvey (Laser Magic Ltd, 2 Church Street, Seaford, East Sussex, BN25 1HD, UK; tel: +44-1323-890752; fax +44-1323-898311 lasersmagic@btinternet.com) wrote to say, "Dear Susan, Laser Magic has a product called the StratoSphere, they are mobile projection domes 50-ft wide by 65-ft tall. We have internal video either 1/2 dome or full dome, they are very new and you can find real images on our web site, www.lasersmagic.com We have one in the UK and one in the Middle East. In April, we are using the UK dome as the centre piece for a brands launch and in Bahrain, we are using the dome as a centre piece for a science park.

Although these are not currently being used as planetarium domes, it is interesting to know about the new technology.

**ZPS-Cubex** - Astronomia Educativa S.R.L., Casilla de Correo 4184, C1000WB- Buenos Aires, Argentina; telephone: 54 11 4697 2815; fax: 54 11 4697 9067; website: http://www.zps.com.ar; email: cubex@datafull.com

John Mosley reminded me about this one. They advertised in the last issue of the *Planetary*. Although I had seen the at IPS 2000, I was not aware that this system was now for sale. There are 2000 stars per cube (to magnitude 5.0) and the visible planets, moon and sun projection are independently moveable. There is a rotation motor toggle switch for use with northern and southern hemisphere projection and a handheld constellation outlines slide projector with dimmer switch. It comes with a 5 or 6-meter nylon dome.

**Mobile Domes in Business**

Rod Bisher expressed interest in starting a "user group" of people who run a mobile dome as a business. To that end I have tried to help by contacting the business owners that I know. I sent each owner a message about this idea and a survey for them to complete. So far I have gotten five completed surveys. I will forward copies that I receive to Rod and tally responses for a future note in this column. If you are interested in communicating with these business owners and/or becoming part of the "users group" I will be happy to send you a survey and a list of the business people I am in contact with. The answers you provide on the survey will enable me to help people who want to start their own business. If you know of any other business owners, please give me their contact information.

**That’s All for Now**

Looking forward to seeing many of you at IPS 2002!

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**Astronomers Respond to Claims that the Universe is Young**

**Material for Teachers About How We Know the Age of the Universe Is Now On Line**

In several U.S. states there have been demands that discussions of the Big Bang and the vast age of the cosmos be excluded from science curricula in K-12 classrooms. In response, the Astronomy Education Board of the American Astronomical Society (AAS) has put together an article for teachers on how astronomers know that the universe is old and that it changes with time.

The illustrated article has been posted on the Web at: http://www.astro society.org/education/publications/mln/56/. It is a special issue of *The Universe in the Classroom*, a newsletter on teaching astronomy in grades 3-12, published by the Astronomical Society of the Pacific.

The article explains the evidence showing that we live in a universe that is between 10 billion and 15 billion years old and that both the universe and its contents undergo evolutionary change. It is designed to help teachers explain these ideas to their classes and concerned community members. A list of written and web resources is also included.

The article grew out of a formal statement on behalf of the astronomical community issued by the Council of the AAS in 2000, when the Kansas State Board of Education in 1999 adopted state standards that eliminated both evolution and Big Bang cosmology. While those standards have now been repealed, following the election of new Board of Education members, the scientific perspective continues to be questioned in states and communities around the U.S. Both the AAS Council, and the Society’s Astronomy Education Board feel that astronomers have an obligation to assist teachers in sorting out the evidence supporting our modern view of an ancient universe.

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**References**


4. Ibid., on p. 268.


10. Ibid.


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The graphics of conventional laser projectors can drift during a presentation up to 30 centimeters away from their original position. Thanks to the use of LOBO's DLL-fed digital projectors, LACON-5 reliably merges laser graphics and conventional media, such as slides, videos or star projections. You can even target small bouncing mirrors for beam effects directly by the laser projectors without a beam table.

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The LACON show library currently consists of more than 250 spectacles of various types. The multi-awarded LOBO design groups helps you to realize even most demanding projects in time and in budget.

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Minolta’s new MEDIAGLOBE combines traditional planetarium motion with a digital projection system. With the touch of a screen, MEDIAGLOBE accurately and realistically immerses audiences in 6,000 stars, the sun, moon and planets, all at the speed of light. MEDIAGLOBE features:

- High speed dual processors
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- Full-dome diffraction-limited Minolta optics
- Built-in sound system

At 1220mm (48") in height, the MEDIAGLOBE is designed for smaller domes that like to think big and can be customized to fit existing planetariums or any size classroom or exhibit hall. So, whether it’s a look at tonight’s sky, a shuttle launch or a simulated flight through an asteroid field, learning has never been more exciting.

MEDIAGLOBE:

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For more information contact:

U.S.  MegaSystems, Inc.  215.546.5300  •  Fax 215.546.2443  •  www.megasystem.com
Minolta Planetarium U.S. Office  201.934.4732  •  Fax 201.818.0498

Other Countries  Minolta Planetarium Co., Ltd.  81.6.6386.4950  •  Fax 81.6.6386.4922

MINOLTA  The essentials of imaging
What’s New

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

Even as the ruddy ember of Mars disappears into the glare of the sun this June, Mars Odyssey is firmly ensconced in its working orbit, taking infrared images and probing the soil for evidence of water ice and revealing what cosmic ray dosimeters might read for astronauts mucking about on the surface one day. It could almost wave (if it had a hand) to its fellow orbiting Martian, Mars Global Surveyor, which is picking its shots these days to round out an impressive data base of delightfully odd and tantalizing landscape features.

It’s all part of an Earthly invasion designed to help us understand (and perhaps ultimately visit) this most Earth-like of the other planets, which we may eventually know at least as well as we do that closer alien world called the ocean floor.

What we learn about Mars, of course, can help us understand the Earth, even as new squadrons of satellites leave virtually no stone unsensed in our modern-day quest to know everything there is to know and see everything there is to see concerning our own cosmic digs. Just recently (as I write), instruments on NASA’s Terra satellite have been watching icebergs calve from a disintegrating ice shelf in Antarctica, and detecting signs of life in dormant volcanoes around the Pacific Rim. And I’ve just read a fascinating article about the analysis of the Hawaiian Islands’ “wake” (a warm counter-current) analyzed by QuikSCAT (which measures ocean surface winds) and TOPEX/Poseidon and TRMM (Tropical Rainfall Measurement Mission) which can sense ocean currents – and speculating how this warm west-to-east wind-and-water current might have helped those first Polynesian aquanauts reach the Hawaiian Islands.

It’s one small finding in the mission of orbiting instruments and Earth-bound scientists to characterize the “big picture” of how the Earth works, of defining the Earth as a system of interacting processes - in other words, as a planet.

That sort of talk is right up our professional alley. And it leads, in characteristically round-about fashion, to the primary subject of this quarter’s column: a motherlode of resources concerning Planet Earth.

Earth Science Cornucopia

Last November, I attended the NASA Earth Science Inquiry Institute hosted by NASA and the Science Museum of Minnesota in St. Paul. It provided an exceptional opportunity to hob-nob with fellow science educators and NASA experts, and for participants to connect NASA Earth Science resources, information, and technology with our own education, exhibit, and programming efforts.

The emphasis was on Earth systems science – treating the Earth as an integrated system and seeking a holistic view of how the Earth works by gaining in-depth knowledge of system components and processes (including human influence) and how they interact and feed back. And in the case of education, to foster an understanding of these systems and their implications for life and long-term variability and change.

The institute featured a wide variety of speakers and experts covering an equally wide range of space-based research and educational efforts, and there was a wealth of information and resources to be shared. Following are some of the more concrete bits which may help you in your own efforts to educate your constituencies about good old terra firma on which we stand to gaze at the stars.

NASA Earth Science Enterprise and ESIP Web Sites

NASA’s Earth Science Enterprise had a new web site as of last November, and you’ll find it at <www.earth.nasa.gov>. It’s an excellent and growing compilation of images, data sets, and educational references all dealing with a space-based view of Planet Earth – a wonderful resource for peeking at our home.

The “Earth Observatory” section features a selection of images from such satellites as SeaWIFS and Terra, and the Shuttle Radar Topography Mission (SRTM), nicely organized by global regions, countries, and in the case of the U.S., by state. You’ll also find true color and false color and graphic images on ocean temperatures, winds, snow cover, storms, population effects, erupting volcanoes, and just about every other sort of application you can think of. You can build animations from on-line data sets on UV exposure and ozone concentration and numerous other variables over selected periods of time. There’s also a kid’s section and a very nice historical section which provides good information on all of the Earth-watching satellites and missions NASA has launched since Sputnik went up. And on-line versions of the Enterprise’s strategic plan and educational catalogs and reports.

There’s much to mine here, and it’s nicely organized and current, with search capabilities to boot. This is a web site definitely to be bookmarked, and I highly recommend a browse whenever your space destination is Earth.

And while you’re at it, take a peek at the Earth Science Information Federation web site at <esipfed.org>. This site describes a federation of Earth Science Information Partners (ESIP’s) – data centers that take NASA data and create new products for specific user groups. There are some 2,000 data bases of assorted information that can be accessed, as well as information on the various partners and what they do. You may find useful bits here.

Satellite Missions and Applications Web Sites

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Satellite Missions and Applications Web Sites

Virtual Earthly every Earth-sensing mission has its own web sites these days; several you may want to check out are listed here.

Terra, launched in December, 1999, is the flagship spacecraft of NASA’s Earth Observing System (EOS), a capable little workhorse charged with beginning the collection of a 15-year data set on our planet, monitoring everything from sea surface temperatures and cloud cover to vegetation mapping, the Earth’s radiation budget, and global pollution. Its web site at <terra.nasa.gov> provides information and links to its every-growing data base. Good pickings here on a variety of studies.

Another good web site is that of the Tropical Rainfall Measuring Mission (TRMM) at <trmm.gsfc.nasa.gov>. This satellite, a joint effort of NASA and the National Space Development Agency (NASDA) of Japan, measures tropical rainfall and the associated energy release which helps to power global circulation, weather and climate. You can find out where it is, where it’s raining the left, and can access a data base of past imagery, including maps of tropical rainfall measurements by month.

During the Earth Science Institute, we had an opportunity to travel to the University of Minnesota’s College of Natural Resources to see some interesting applications of the data produced by EOS satellites, especially Landsat and Terra. The Remote Sensing and Geographic Analysis Lab there uses EOS data to develop data bases that can help to monitor land use and natural resources. The lab’s goals include image processing to develop useful products for land cover classification and vegetation profiles, for example; to deliver those products over the internet; and to educate the public on the use of Earth satellite data for land applications and to provide resources and activities for use by teachers.
We had an opportunity to use one of these products when we wandered about the campus with global positioning system units and palm pilots loaded with local maps, watching the palm pilot pinpoint our shifting locations on the maps displayed. One could imagine an intrepid forest ranger hiking through the trackless forest of northern Minnesota, outlining on his/her easily-carried palm pilot an area of blow-down or insect infestation. Cool!

A couple of the lab's web sites worth noting are <terrains.gis.umn.edu> which offers insight into the applications process as well as some educational exercises on scaling and mapping, and <eforest.gis.umn.edu> which outlines a project on forest classification using satellite imagery.

Science Bulletins

At the institute, Smokey Forrester of the American Museum of Natural History in New York demonstrated an example of the museum's new "science bulletins" which he produces there: continuous-loop, high-definition TV visualizations on biodiversity, Earth science, and astronomy, presented in large-screen format for playback as MPEG2 files from an HDTV video server.

We viewed EarthBulletin in which a primer on volcanoes, earthquakes, and hurricanes played out on the backdrop of a global view of the Earth, with focus on current events around the world. It was exceedingly impressive - the sort of thing you could imagine visitors just standing and watching in the exhibit areas of the museum where they play. The museum also employs smaller touch-screen interactive kiosks.

Smokey indicated that the museum would like to distribute these excellent products to other museums on a subscription basis, in which the clients provide the hardware and the American Museum of Natural History is responsible for supplying content, which could be updated over the internet. If you'd like a peek yourself, and more information on this prospect, contact Smokey at the American Museum of Natural History, 1-212-496-3559, email smokey@smokey.com.

Science Films, Anyone?

Another of the institute presenters was Ron Tobias, program coordinator of Science and Natural History Filmmaking at my own Montana State University in Bozeman. MSU has the only graduate degree program in the world in this discipline, and is the only academic program Ron knows of in the U.S. that teaches and allows students to produce in high definition media. The program is based on the extraordinary premise that people who make films about science ought to have a background in science, and the goal is to produce filmmakers proficient in both science and filmmaking.

MSU is in the process of incorporating a program track called Museum Studies, in which students will work with a funder and a museum to develop visual materials for that museum. If you've got some ideas, or need some work done, you might contact Ron to see if your project and one of his students might be a good match. Ron can be reached at Montana State University at 1-406-994-6227, email tobias@montanapbs.org.

Weather Sites

During the course of the institute, we had several presentations on the subject "everybody talks about," from people who are doing something about it, at least in terms of studying the global picture of weather and climate, and suggesting how we might use weather data in museum settings. One useful visit in particular was to Meteorogix in the Minneapolis-St. Paul area - the largest commercial weather visualization company around, which helps some 22,000 clients (from networks and airlines to public transportation and utilities) get precise, real-time weather data. The computer power at work was impressive, as were the graphic visualizations of weather occurring as we watched the screens. The possibilities for such real-time displays in museums were quite tantalizing.

The company has a free weather site you can browse called <wx.com>, but be forewarned that you need to have Netscape 6+, Internet Explorer 4+, or Mozilla 0.9+ to access it. The company is interested in collaborations with museums in weather education, including curriculum development with a real-time weather station thrown in. If you're interested in exploring this notion, you might contact Ron Sznaider at Meteorogix, 11400 Rupp Drive, Burnsville, Minnesota 55337 USA, 1-952-882-4574, email RonSznaider@meteorogix.com.

In any case, there is a plethora of weather and climate-related web sites for the browsing, and I received a hefty list of them during the institute. There's something here for everyone, so enjoy:

NOAA Climate Prediction Center: <www.cpc.ncep.noaa.gov/index_frame.html>
NOAA National Climatic Data Center: <www.ncdc.noaa.gov/main.html>
National Weather Service Headquarters: <www.nws.noaa.gov>
NOAA ENSO Home Page (El Nino): <www.ssg.noaa.gov/enso>
NOAA ENSO Home Page (La Nina): <www.gdp.noaa.gov/enso>
International Weather Satellite Images: <www.people.fas.harvard.edu/~dbaron/sat>
Unisys Weather (mapped images of forecast models): <weather.unisys.com>
NOAA Storm Prediction Center: <www.spc.noaa.gov/index.shtml>
Naval Pacific Meteorology and Oceanography Center, Joint Typhoon Warning Center: <www.npmoc.navy.mil/jtwc.htm>
WSI Corp Intelligent: <www.intellicast.com>
United Kingdom Meteorological Office: <www.metoffice.gov.uk>

National Drought Mitigation Center: <enso.anl.edu/nndc>
Global Fire Monitoring Center: <www.ruf.uni-freiburg.de/fireglobe/current/globalfire.htm>
NOAA National Hurricane Center: <www.nhc.noaa.gov>
Environment Canada: <weather.ec.gc.ca/index_e.shtml>
NOAA National Oceanographic Data Center: <www.nodc.noaa.gov/dsdt/wtg12.html>
NCAR Forecast Models: <www.rap.ucar.edu/weather/model.html>
National Ice Center (polar ice conditions, iceberg): <www.naitoce.noaa.gov/home.htm>
Colorado State Arctic Oscillation Web Site (Arctic updates): <horizon.atmos.colostate.edu/ao>
University of Washington Pacific Decadal Oscillation Web Site: <tao.atmos.washington.edu/pdo>
Columbia University North Atlantic Oscillation Web Site: <www.ldeo.columbia.edu/nao>
The Weather Underground: <www.weather.com>
Cable TV Weather Channel: <www.weather.com>
USA Today Newspaper (forecasts): <www.usatoday.com/weather/weather.htm>
World Meteorological Organization: <www.wmo.ch/indexflash.htm>
NOAA North Central River Forecast Center: <www.crh.noaa.gov/nrnc>
University of Minnesota/State Climatology Office: <www.climatology.umn.edu>

Earth vs. Space Science

Our good friend Anita Sohus from the Jet Propulsion Laboratory in Pasadena, California, provided an excellent overview of space science and missions to balance our rather
one. One of the cleverest features is the “latest image” sections, where you can update the database to include what the weather looks like today over the Earth, or where the Earth currently has snow, or the latest drought conditions in the U.S., or how wet the soil is, or where there are currently active volcanoes or earthquake activity. So long as you’re operating from your hard drive with a proper internet connection, an “update” button allows you to retrieve the latest images from either the source site or the Rice University mirror site. It’s a great way to see the latest goings-on for Planet Earth.

The CD-ROM also includes an exhaustive help section which explains how to install and update, includes frequently-asked questions, and provides classroom activities and a teachers guide which key off of the information in the CD-ROM. It’s all quite a neat and tidy, and offers great possibilities for use in exhibit computer kiosks, the classroom, or at home.

I also snared a copy of MuTPE’s earlier product, a CD-ROM called Space Update. It’s without some of my favorite design features and educational approaches of the later Earth Update CD-ROM, but is still nicely realized and very serviceable, concentrating on all things spacey.

It’s divided into its own five areas of investigation: (deep sky) astronomy, the solar system, space weather, space events, and the sky tonight. The Astronomy section focuses beyond the solar system, with categories featuring stars and nebulae, clusters, galaxies, “what’s new,” and a section called “all sky.” It’s more image-driven than question-driven (a feature of Earth Update that I really like), but showcases excellent images (many of them from Hubble) with information captions, though images and captions overlap and so you can only access one or the other at the same time. There are some nice movies here, such as a zoom-in and animation sequence on the galaxy Centaurus A, ultimately revealing an animation of the black hole believed to lurk in its core. “What’s new” includes recent imagery, but my favorite part was “All Sky,” cleverly devised so that as you slide a little bar along the electromagnetic spectrum, full-sky images of the universe in the corresponding wavelength appear in the window. Great idea!

The Solar System section was very nicely organized in a screen format more similar to Earth Update, allowing the user to select a planet and then select images with captions (appearing in different parts of the screen format and thus viewable at the same time) or little zoom-ins or movies, and/or images and copy on planetary moons. The Space Weather section featured similar data on the earth, the sun, auroras (including some fine little time-lapse movies), and other related bits, with possibilities to update imagery to see what the sun looked like today, for example. The Space Events section included headline pieces on recent activities in space exploration and such, and hosted valuable links to other current-event sites such as the Astronomy and Earth Science Pictures of the Day, HST and Sky & Telescope sites, and the Heavens-Above site to track major orbiting hardware.

The fifth section, the “Sky Tonight,” is a little planetarium-in-a-computer piece, showing the sky for the latitude of your CD-ROM (you have choices here) in one of the cardinal directions or overhead, at either dusk or dawn. You can run the simulation forward or back through time, continuously or in steps, watching the stars and constellations come and go and the moon and naked-eye planets slide along the zodiac. In fact, I was able to use the simulator to enjoy the evening dance of the planets we’ll all be experiencing between late April and early June.

These are fine products, Space Update useful for the same applications as is Earth Update. And the cost is extremely reasonable: $20 U.S. apiece with $5 shipping and handling. If you purchase both, the shipping and handling is free. You can print out and use the imagery (some of it public domain from NASA, some of it from Rice) for educational purposes, and can get a full site license for use. And you can choose your copies for your latitude in the case of Space Update (which gives you an appropriate “Sky Tonight” latitude, and for your area of the U.S. (which gives you access to weather images for your region). You might ask if there are Earth Update versions which focus on other areas of the world in their weather data — global weather imagery is included in the CD in any case.

Minimum computer requirements for a Macintosh include 120 MHz of a faster Power PC, Mac OS 8.1 or later, 64 MB or more of installed RAM, Netscape 4.0 or Internet Explorer 4.5 or AOL 4.0 or greater, and 800 X 600 screen resolution. PC minimum requirements include 166 MHz Intel Pentium processor or greater, Windows 95 or 98, 64 MB or more of installed RAM, and internet browsers and screen resolution similar to the Mac. You can check out the project and products at a couple of Rice University web sites: <earth.rice.edu> and <www.spaceupdate.com/>. For more information or to order, contact Dr. Patricia Reiff at the Rice Space Institute, Rice University - MS 108, 6100 Main St, Houston, Texas 77005 USA, telephone 1-713-348-4634, fax 1-713-348-5143, email connect@space.rice.edu. Check these out.
Incidentally, during the institute we all got to play with a number of new toys that Carolyn is in the process of "flying" on the space shuttle - some of them actually quite old toys culturally, and from a variety of cultures. Ask her about them the next time you see her.

Oceanography Package

One of the take-aways I took away from last November's institute was an information package from the Oceanography Outreach Team at the Jet Propulsion Laboratory, 4800 Oak Grove Drive, M/S 264-355, Pasadena, California 91109, telephone 1-818-393-1064, fax 1-818-393-1173, email topex@jpl.nasa.gov. The package includes information, images, and web sites for a variety of Earth-sensing satellites that study the oceans, including Topex/Poseidon, TRMM, QuikScat, Jason-1, and SeaWiFS.

There are CD-ROMs containing useful bits on some of these missions as well. There's one on Topex/Poseidon called "Visit to an Ocean Planet," which is nicely designed and user-friendly and question-driven as it presents images and animations and descriptions of Topex/Poseidon data on El Nino and any number of other ocean characteristics and phenomena, as well as a series of classroom activities associated with each major theme. Another useful thing to have. The TRMM mission which measures tropical rainfall also has a CD-ROM out; this one is more a mere compilation of data without the benefit of an interactive design. But it includes a PowerPoint presentation overview of the mission, a listing of TRMM-related publications, and some very nice animations of rainfall concentrations, hurricane profiles, and the like.

Lots of good stuff here; check with the JPL team as given above.

ViewSpace Unzipped

John Stoke, Informal Science Education Manager for the Office of Public Outreach at the Space Telescope Science Institute, 3700 San Martin Drive, Baltimore, Maryland 21218 USA, telephone 1-410-338-4700, fax 1-410-338-4767 (and definitely a good friend to the planetarium community), has written to me with the latest information on his excellent ViewSpace project, which creates free-running, PC-based montages of Hubble images with accompanying interpretation, designed as esthetic and educational interludes for quiet corners of the exhibit spaces of our museums and planetariums, (That's all one sentence, so take a mental breath.)

Alas, I am a Mac shop and John has created a PC universe, so I am unable to run the CD-ROM he sent me. But if it's anything like the exquisitely realized pieces he's presented at conferences, it surely shows off Hubble - and the universe - at its most wonderful. John indicates that the latest compilation includes about 70 minutes of material before anything repeats, and he's slowly ratcheting up the technical sophistication while maintaining focus on the cosmos he interprets for us.

ViewSpace now comes in two formats: the traditional 4:3 monitor/aspect ratio, and a 16:9 ratio for plasma screens. John also plans this year to offer automatic and more frequent updates via the internet, including newly-released images virtually as they appear from the institute. Further, he's working on boilerplate language for funding proposals to help planetariums and museums apply for local funding of the hardware to run the pieces with the prestige of the HST to back them up.

John says the project seems to be gaining momentum, which is great to hear. The stuff he does in ViewSpace is so good, it almost makes me yearn for a PC. Well - at least for the exhibit area.

If you're not familiar with ViewSpace, contact John to become so; you'll be glad you did. In addition to the above contact information, you can reach him at email stoke@stsci.edu, or you can check out a useful web site at <informal-sci.stsci.edu>.

Star Quest Fundana

If you're having trouble holding in your brain all of the information you've encountered so far, you could wrap our final item around your head to keep those excess web sites from dribbling out your ear. It's the Star Quest Fundana, the flexible, washable, crumpleable, glow-in-the-dark, tie-around-your-neck star map/bandana that you can take anywhere you can take a handkerchief.

It's one of a series of imprinted bandanas or "fundanas" created by Imports Unlimited Company, Inc., 2 Virginia Avenue, Beverly, Massachusetts, telephone 1-800-593-7076, fax 1-978-524-0365, email admin@importsunltd.com. It displays, in white fluorescing print on a black cloth, nearly a dozen constellations visible in Northern Hemisphere skies with Polaris at the center. In the corners are useful diagrammatic bits which indicate which stars make up the Summer Triangle, the Winter Circle (or Hexagon for those of us who only draw straight lines between stars), a list of the constellations that are circumpolar from the North Temperate Zone, and how to use the Pointers to find Polaris.

There are also a few helpful instructions along one side which tells you to orient the map according to the position of the Big Dipper in the sky and use it as a reference point for finding other constellations - simple and appropriate.

My copy didn't seem to glow in the dark terribly brightly for my aged eyes, and it would gradually lose some oomph on those long nights of stargazing, but you could easily supplement with a small red-filtered flashlight. My only quibble is that all of the stars depicted except for first magnitudes use the same size five-pointed star, and I might have varied the sizes more according to magnitude - and might have simplified a few of the patterns. But this is picky; it's quite charming as it is. And even if you already know the constellations or have a conventional planesphere or star map to use, this makes a fine wearable accessory and conversation piece for your next star party. I very much like it.

The Star Quest Fundana is just one of a series. The others are imprinted with squares in the fashion of a game board or bingo card, and are designed to prompt nature-friendly scavenger hunts in various environments. For the Nature Quest, Beach Quest, and Tree Quest fundanas, you pick a number from 1 to 20, count from a square marked one, and scramble off to search for whatever is described on the selected square that has to do with natural or beach environments or trees - a shell, a feather, a leaf, something a bird would eat, something soft, something round. You then jump to other squares until all have been accounted for. The remaining fundana is called Bug Bingo, and involves two teams placing markers (such as stones) on the imprinted board when they find bugs or bug-related bits that fit the descriptions on a squares - a green bug, an insect with long legs, insect eggs, a spider web higher than your waist. The first team that gets a complete row filled with its markers wins.

These are clever activities for kids or families on an outing, designed to keep kids exploring and gaining awareness (and respect, we hope) for the natural world. There are no loose pieces to lose, and when night falls, you can haul out your flexible, washable, crumpleable, glow-in-the-dark, tie-around-your-neck star map and enjoy the sky.

Fundanas wholesale for $3.50 U.S. each. These would be cute and inexpensive sales items for your gift shop, and could serve well as little diversions tucked away in the picnic basket to keep the kids busy and involved. To learn more or to try them out, you can contact Caryl Fox as given above or at email address csfox@importsunltd.com.

Finally...

That does it for this time. Happy solstice, be kind to Mrs. Earth, and as always, what's new?

[As a convenience to save readers from typing URLs, this article is posted at www.GriffithObs.org/IPSPhatsNewJune2002 (note capitalization) - Ed.]
Gibbous Gazette

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The true definition of the word planetarium is currently being fought out on Dome-L, the IPS sanctioned, but privately run, daily email-based information service for the world’s planetarians. The debate will rock this community to its very foundation. Planetariums will change, but one thing that never changes is our enthusiasm for astronomy and our ability to relay that enthusiasm to our audiences - regardless of whether they are inside an inflatable plastic dome or a fully digital cyberdome. If you’d like to relay some of your enthusiasm to your colleagues, please send me a note or email at the address above and I’ll include it in a future column. Until then I’d like to start this edition with a very special...

Planetarium Alignment!
The staff of the Albert Einstein Planetarium at the National Air and Space Museum (Washington D.C., USA) and the employees of Sky-Skan, Inc. (Nashua, New Hampshire) played co-hosts to a sneak preview party on Friday April 5, 2002 of the new planetarium show Infinity Express, designed exclusively for the theater’s new High Definition SkyVision System. Kudos go to Planetarium Director Cheryl Bauer and her staff including Deb Fuller, Chandra Holmes, Shannon Lee, Dalton McIntosh, Frances McRae, Jay Miller, Sean O’Brien and Bruce Wood on a truly amazing show narrated by Laurence Fishburne. Also in attendance were Gen. John R. Dailey (Director of the National Air and Space Museum), Micheal Altman, Gary Beer, Jeanny Kim, Lisa Mazzio, Toby Mensforth and Dan Stevenson (Smithsonian Business Ventures Division). Production of Infinity Express was handled by Sky-Skan - Australia’s Jack White (Executive Producer), Jennie Zeiher (Production Manager) and Joanna Gardener (Production Designer). Other Sky-Skan employees out for a much needed night of fun included; Phillip Allen, Denise (she puts the special in special effects) Banacos, Kevin Beaulieu, Matt Brown, Cindy Duval, Claude Ganter, David Miller, Scott Niskach, Amy Quesinberry, and Glenn Smith from the Sky-Skan - Europe office. Barco reps Susan Camp and Phil Laney had twelve reasons to smile all evening long! A glittering assortment of past and present planetarians filled the chamber including: Wendy Ackerman, Sally Goff and Joe Halley from the Davis Planetarium in Baltimore, Maryland; Susan Barnett from the Buehler Planetarium in Melbourne, Florida; Carter Emmart and Ryan Wyatt from the Hayden Planetarium in New York, New York; former NASM staffer Geoff Chester now from the U.S. Naval Observatory in Washington D.C.; Dr. Bill Gutsch of Great Ideas in Kinnelon, New Jersey; Jonathan Harmon from the Arlington Planetarium in Arlington, Virginia; Rod Martin from the Brish Planetarium in Hagerstown, Maryland; Laura Misajet from Seller Instruments/Zeiss Inc. in Narberth, Pennsylvania; Lois and Steven Nichol from the Morehead Planetarium in Chapel Hill, North Carolina; Mark and Carolyn Collins Peterson from Loch Ness Productions in Groton, Massachusetts; Derek Pitts from the Fels Planetarium in Philadelphia, Pennsylvania, and Jim Sharp former Albert Einstein Planetarium Director and mentor to many in attendance. Lots of other well-wishers came to show their support including; Tom Casey from Home Run Pictures in Pittsburgh, Pennsylvania; Dave Oxenreider of Singularity Arts in State College, Pennsylvania; Patricia Reiff of Rice University in Houston, Texas, and John Stoke and Frank Summers from the Space Telescope Science Institute in Baltimore, Maryland. There was even a special guest appearance by Rob Landis of NASA/JPL in Pasadena, California. But the night really belonged to Sky-Skan owners Ginger and Steve Savage who, along with their parents, family members, and the other attendees, finished the night off with a buffet supper inside the Imax Jazz Café at the National Museum of Natural History just across the National Mall. It was truly a crowning moment in an already stellar career for the both of them. All in all, a very satisfying ending to a grueling production and the marvelous beginning of a new era at the Albert Einstein Planetarium!

You will be missed...
...long time Director of the Fleischmann Planetarium, Arthur Johnson retired from his position at the end of 2001. Art began his career at the Reno, Nevada facility in 1973. Taking over the position at a time when the University of Nevada was seriously considering closing the planetarium, Art championed the importance of the theater and diverted its impending shutdown. Art served as the first president of the Large Format Cinema Association and he was one of the original board members of the Pacific Planetarium Association. Art was responsible for raising the image of the planetarium and its programming and he oversaw a major renovation of the facility in 1994, including a new 70 millimeter large-format projector, video equipment, automation control, and a wide-angle slide projection system. Art will spend his newly found free time devoted to his "second career" at the organ of the Reno Trinity Episcopal Church, were he also acts as choir director.

Laserium Ends 28 Year Run
John Hare (ASH Enterprises) wrote to report his eyewitness account of the final performances of longest running laser show in the world...

On Saturday evening, January 5th, the final performance of Laserium was presented in the Planetarium at the Griffith Observatory in Los Angeles. Linda Hare (former Executive Director, International Laser Display Association) and I cashed in a ton of frequent flyer miles to make the 36-hour jaunt to Los Angeles and back to our home in Florida for the occasion. The show closed not because of faltering attendance or any other reason, except that the entire planetarium was to be closed beginning two days later until 2005 for extensive renovations. Laserium opened at the Griffith in 1973 and had played continuously since. It was the longest running production of any kind in Los Angeles and unquestionably the longest running laser show anywhere in the world. Insiders in the laser and planetarium community are fully aware of the far-reaching implications of Ivan Dryer’s successful endeavor, which opened the floodgates for laser presentations in planetariums and other venues, so I won’t relash those details.

Ivan advised that we should arrive early because of the anticipated crowds. We left our hotel by taxi at about 6:30, (for the 9:45 show), with assurances that it was only a 5 or 6 minute ride. After sitting in a traffic jam for nearly a half hour at the foot of the hill on which the planetarium is situated, we decided to walk. I’d highly recommend it for anyone wanting a good workout. That’s not exactly what we had in mind but at least it got us there by about 7:30.
The front lawn of the planetarium was packed. People were lined up by the hundreds and others were milling about. We were fortunate to run into Ivan out front and were invited to see the 7:45 star show. Once in the theater, Ivan suggested that we remain through all the shows since to exit and attempt reentry would be chaotic. The planetarium lecturer mentioned that the very uncomfortable planetarium seats were also scheduled for replacement and we could understand why after just the first show. After enjoying a well-presented feature on Mars and the first laser show, Dark Side of the Moon, we waited in anticipation for the final show.

As we watched the crowd file in we noticed a number of familiar faces. Ivan had invited laserists from all past Laserium venues as well as production and support staff and others, and a large number were in attendance. Barbara and Seiji Inatsugu, John Tlip, Mitch Hartman, Ron Hipschman, Benjamin Mendelsohn, past and current Griffith staff including Ron Oriti, and representatives from the media among others, were there. After the customary pre-show announcements, Ivan took the mic and welcomed the audience. He gave a brief synopsis of the history of the show, then announced that the final show, Laser Visions, would open with The Blue Danube, a selection from the original Laserium show. Laserist Tim Barrett gave an inspired performance to an enthusiastic capacity crowd of over 600!

Following the conclusion of the show and the departure of the general public, the invited guests were told of plans for the next generation of laser entertainment that Dryer has already been working on. A freestanding facility, Cyberdome, will incorporate interactive displays, live performers, lasers, and other innovative forms of stimulating sensory media. He urged all to visit their web site [www.laserium.com] to follow the project as it develops. Finally, we all adjourned to a nearby pub and restaurant for food, libation, and reminiscences of past times. All in all it was an exhausting but thrilling experience.

People On The Move

At the beginning of 2002, Jon Shaw, previously Executive Vice President and C.O.O. for Spitz, Inc., was named President and C.E.O. for the company. Charlie Holmes was promoted to Vice Chairman of the Board. Both administrators work from the Chadds Ford facility.

Geoff Skelton (formerly with the Fisk Planetarium and the Fels Planetarium) and Mark Trotter (formerly with LATech, Shreveport and the Louisiana Nature Science Center) have joined Bowen Productions, Inc. in Indianapolis, Indiana. Mark was immediately assigned as Senior Project Manager for the $3.4 million interactive exhibit systems contract for the new Indiana State Museum and manages the Bowen installation office on site. Geoff has been out installing Barcos like crazy and has just started working on exhibit content installation and show control programming for the over 150 interactive exhibits. Fear not, they will be finished with the project just in time to get out to the regional and IPS conferences ... although they both might be asleep on their feet.

New and Noteworthy

Eddy Pirotte (Planetarium Beisbroek in Bruges, Belgium) wrote in to report that their planetarium has undergone a major upgrade. Eddy writes, "After working for fifteen years with a Viewlex-Apollo, we submitted our first dossier for renovation in February 2000. Considering all possible pros and cons, we finally decided to go for the Zeiss ZKP3 Skymaster. While this magnificent piece of equipment isn’t handled from the centre of our 7.3 m dome, we had to construct an operating desk in the wall of the planetarium. This reduced our number of seats by two to 45 in a concentric setting. Our search for the necessary funds proved to be so successful that we even were able to order an all-sky projection system by Sky-Skan. To lower the number of projectors somewhat in order to reduce the weight on our budget, we went for a 9-projector array. Eight of them are installed in a similar way to an ordinary panorama setting but in portrait rather than landscape mode. This makes the picture go quite high up, but doesn’t cover the whole dome: it leaves the area around the zenith open. Tilting a slide projector to the needed angle was impossible without building some device to suck the slides into position. To get at the zenith, we direct the ninth projector right across the dome, but deflect the light beam with a thin mirror. This awkward way of setting the projectors up, gives us the opportunity to project panorama’s as well as all-skies with a limited number of projectors. And it works remarkably well. Okay, we still need a lot of fine-tuning, but as you all know, this is something that can take a long time to get to perfection. Due to the limited available space in our dome, we had to figure out something similar for the positioning of our new dome. With the aid of a "periscope", we bend the light beam over 180° so we can put the mirror right on top of the slide projector. Our ultimate goal was to renew our exhibition area as well, and in this too we were successful. This means that we are now ready to try and raise our number of visitors to some 15,000, hopefully within the next three years."

Tom Casey of Home Run Pictures in Pittsburgh, Pennsylvania, has just finished a new SkyVision immersive program for the Houston Museum of Natural Science’s Burke Baker Planetarium on the sinking of the Titanic. The program takes the popular story into the all-dome format ... the audience experiences the sinking from the viewpoint of a survivor in one of the lifeboats. You can see a case history with imagery at http://www.hrpictures.com/titanic.

The benefits of planetarium technology are starting to spread to the other domed venues worldwide. The following report comes from Glenn Smith of Sky-Skan - Europe. "In Seville, Spain, the world’s first pitless SkyVision theater recently opened as the newest attraction at the Isla Magica theme park. Situated on the Cartuja Island on the former site of EXPO’92, the new theater is installed in “El Cubo”: a giant cube and part of the National Pavilion of Spain. Sky-Skan was instrumental in the concept and design of the new theatre, which was an ambitious project itself, as it was completed in less than 5 months! In addition to the SkyVision High Definition system, a 3-channel digital surround system was provided, as were additional components to aid in hosting conferences and corporate events. Sky-Skan was also responsible for the production of the opening show. Produced by the Graphics Production Department of Sky-Skan in the USA, The Secret of the Dragon is a 10 minute show in full high-resolution 3D computer animation, which tells the story of a dragon on a quest to show humanity the beautiful nature of the Universe." Visit http://www.islamagica.es/simple/planet/planet.htm for a closer look.

Congratulations ...

... to John French (Planetarium Production Coordinator, Abrams Planetarium in East Lansing, Michigan) for having one of his digital photographs posted on the always interesting Astronomy Picture Of The Day site. Surf on over and check it out at http://antwrp.gsfc.nasa.gov/apod/ap020418.html.

... to Salt Lake County and Evans & Sutherland on the announcement of the selection of the new Digistar 3® for the George T. Hansen Star Theater at the Shella M. Clark Planetarium currently under construction at Salt Lake’s new Gateway Center. The 16.8-meter domed theater, which is scheduled to open in November, will seat more than 200 people.

... to the staff of the Planetarium at the Forum der Technik in Munich, Germany on the colossal success of their new laser show, Queen Heaven. The show has been playing to sell out crowds at least once a day since last December when it premiered. Not only did they get access to the entire Queen archive of music, but they also had the direct artistic input of band members Brian May (he has a doctorate in astrophysics) and Roger Deacon, as well as Brian’s sound engineer Justin
Shirley-Smith. One of the show highlights is the world premier of Bohemian Rhapsody remixed in S.1 Surround from the original recording tracks.

... to MegaSystems, Inc. (Philadelphia, Pennsylvania) for being named the US distributors for the Minolta MEDIAGLOBE - The world's first full color digital planetarium.

Did You Know?

Charlie Dodge of Gamma Tech in Albuquerque, New Mexico, has offered to convert digital images to slides for planetarians for a very good price, $1.00 per slide plus shipping! You can upload your files at his web site, www.gammatech.com and have them overnighted back to you. Call Charlie at 1-877-293-9440 in advance to introduce yourself and to set up an account. Thanks goes to Steve Savage of Sky-Skan for finding this great resource!

The folks at Evans & Sutherland in Salt Lake City weren't the only ones playing host to the Olympics this year. That's because of a unique collaboration between the high-definition video equipment and content provider CineMuse, Inc. of New York City and the University of Louisville's Gheens Science Hall and Rauch Planetarium. Thanks to the CineMuse equipment and the Rauch dome, they were able to display high-definition broadcasts of several Olympic events on a 24-hour delay. Planetarium Director Shawn Laatsch and Program Coordinator J. Scott Miller ran the events in an effort to increase awareness of the planetarium's offerings and to focus attention on the unique multimedia equipment of the facility. The Olympic broadcasts attracted crowds of about 40 people each. According to CEO Ted Geier, CineMuse, Inc. has a network of approximately 34 museums and universities with high-definition television in various stages of development.

The astronomers at John Hopkins University have determined the color of the universe. You can have some fun if you go to their website and print out the color swatch they have posted there. Take your print out to your favorite paint or hardware store and tell them that you need to paint everything in your house that color in case the mothership returns. For even more fun, tell them that you need to buy the new color because you have to repaint everything you painted the first color that they announced back in January. Visit http://www.jhu.edu/news_info/news/home02/mar02/color.html for the full details.

Tips and Tricks

Keep your star projectors free of dust. Spitz' Service Department Supervisor, Charlie Wilkin, suggests dusting opto-mechanical star balls only with soft brushes (his secret is using large make-up brushes from cosmetic stores, or camel hair brushes). Reserve canned air for planet and rotating mirrors only. (From the Spitz online newsletter - Thanks to Joyce Towne Huggins!)

Katsuhiro Mouri (Nagoya City Science Museum Planetarium, Japan) passed along a great web site for Japanese constellation finders at http://www.nhao.go.jp/~tokimasa/hayami/hayami.html. Japanese Constellation Finders are called "seiza hayami ban" in Japanese. If you are interested in the page, please contact to Dr. Noritaka Tokimasa for permission to use the resources at this web page. Dr. Noritaka has said this "hayami ban" is free for educational use. His email address is, tokimasa@nhao.go.jp.

That's all for now. I look forward to hearing from you. I especially need information from Asian-Pacific planetarians. This is your Gibbous Gazette. Help me to make it the best it can be and email your news today!

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e-mail:acs@meteorites.de
Greetings of the solstice to each of you, and a happy Father's Day. Shall we begin the celebration with some poetry? A Mother Goose nursery rhyme, that is:

Hickety-Pickety, my black hen
She lays eggs for gentlemen.
Sometimes nine and sometimes ten,
Hickety-Pickety my black hen.

Imagine my delight at discovering The Space Child's Mother Goose book of rhymes among my late father's effects, a slender volume originally published in 1958, before the ISBN system was born. (Thanks to Simon and Schuster for permission to print these here.) It includes another version of the rhyme:

Probable-Possible, my black hen,
She lays eggs in the Relative When.
She doesn't lay eggs in the Positive Now
Because she's unable to Postulate How.

Shades of Uncle Albert!
We grew up on a farm in upstate New York, where the sky was dark and the air was clear, and my father built a telescope for us. Because he's unable to Postulate How.

I remember peering at Saturn, and our Moon, and marveling. How many of us started off in this business in a similar way? I wonder.

Before he moved from Buffalo's frigid climes to the tropics of Florida, Steve Tidey composed a list of slogans for the planets. Here's his email posting:

"Over the weekend my local newspaper, the Buffalo News, printed a funny list of mottos that they'd made up for each state. (For example, Delaware: Bathroom Stop Between Philadelphia and Washington; Hawaii: No Interstates).

This prompted me to sit down and come up with a motto for the main bodies in the solar system. (The one listed for the Sun I lifted from a George Reed article, and the comet one is a quote from David Levy, but the rest are mine). So, here goes:

The Sun - A Thermonuclear Bomb With Great PR
Mercury - You Boil. You Freeze. Deal With It
Venus - Gas Masks R Us
Earth - The Abode Of Life. Catch It While You Can
Mars - Space Probe Killer
Asteroids - Rock Stars
Jupiter - Comet Killer
Saturn - Easy To Run Rings Around
Uranus - Seasons? What Are They?
Neptune - Home Of The Dysfunctional Satellite Family
Pluto - Permanent Host Of All Solar System Winter Olympics ...That Never End
Comets - Like Cats, They Have Tails And Do Just What They Want

Another version:

MÖGLICH-WARSCHENLICH, mein' Schwartzhenn',
Legt ihr Ei in das Relativwenn.
Sie legt keine Eier ins Positivdann
Weil sie postulieren nun einmal nicht kann.

Press release
by: Jim Griffith (griffith@netcom.com)
Valles Marineris (MPI) - A spokesthing for Mars Air Force denounced as false rumors that an alien space craft crashed in the desert, outside of Ares Vallis on Friday. Appearing at a press conference today, General Rgrmmr the Lesser, stated that "the object was, in fact, a harmless high-altitude weather balloon, not an alien spacecraft".

The story broke late Friday night when a major stationed at nearby Ares Vallis Air Force Base contacted the Valles Marineris Daily Record with a story about a strange, balloon-shaped object which allegedly came down in the nearby desert, "bouncing" several times before coming to a stop, "deflating in a sudden explosion of alien gases". Minutes later, General Rgrmmr The Lesser contacted the Daily Record telepathically to contradict the earlier report.

General Rgrmmr The Lesser stated that hystorical stories of a detachable vehicle roaming across the Martian desert were blatant fiction, provoked by incidences involving swamp gas. But the general public has been slow to accept the Air Force's explanation of recent events, preferring to speculate on the "other-worldly" nature of the crash debris. Conspiracy theorists have condemned Rgrmmr's statements as evidence of "an obvious government cover-up", pointing out that Mars has no swamps.

And here's another version of the rhyme:

Plus-que-Possible, ma poule noire,
Elle pond ses œufs dans le Quand-Provisoire.
Elle ne pond point dans une période sure
Car l'expérience serait bien trop dure.

And finally, with the discovery of new types of matter comes the reminder from http://www.ahajokes.com/sci78.html of:

Administratium, The New Element

AMES, IA-The heaviest element known to science was recently discovered by materials researchers at IPRT/ISU. The new element, tentatively named Administratium, has no protons or electrons, and thus has an atomic weight of 0. However, it does have one neutron, 125 assistant neutrons, 75 vice neutrons, and 111 assistant vice neutrons. This gives it an atomic mass of 312. These 312 particles are held together in a nucleus by a force that involves the continuous exchange of particles called morons.

Since it has no electrons, Administratium is totally inert. However, it can be detected chemically, since it impedes every reaction it comes into contact with. According to its discoveries, a tiny amount of Administratium caused one reaction to take over four days to complete; the normal reaction time is less than one second.

Administratium has a normal half life of approximately three years, at which time it does not actually decay, but instead undergoes a reorganization in which neutrons, vice neutrons, and assistant vice neutrons exchange places. Studies have shown that the atomic mass usually increases after each reorganization.

Research at other laboratories indicates that Administratium occurs naturally in the atmosphere. It tends to concentrate at certain points, such as governmental agencies, large corporations, and universities. It is always found in the newest, best appointed and best maintained buildings.

Scientists point out that Administratium is known to be toxic at any level of concentration and can easily destroy any productive reactions where it is allowed to accumulate. Attempts are being made to determine how Administratium can be controlled to prevent irreversible damage, but results to date are not promising.
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