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**Don't Forget:**

Look at the address label on the envelope, and note when your membership expires. If you are overdue, or coming up due soon, mail it in!

**ALSO:** Don't forget to mail in an address change if you move!!!

All letters to Pulsar, and memberships should be sent to Laurie Ortiz at 339 W. University Ave. #A, San Diego, CA, 92103. Any other business please send to the president at the above address.
How To Paint a Really Big Ball
by Michael Carroll

First, get a really big brush... That isn't exactly what I had planned to talk about. What concerns us here is how to depict light falling upon a planet or moon. Painting a globe is trickier than you might think. This little paper will give you some good hints about spheres, lighting, and the nature of light on specific types of planetary surfaces.

First of all, always make sure that the terminator, the line between shadow and light, is an ellipse which connects a diameter across the circle of the globe. The shadowed side of the globe is frequently painted inaccurately by space artists. They fail to notice that a curious thing happens as the sun makes its way around the disk. When the planet is nearly fully lit (fig 1), the night side is quite dark, and virtually disappears against a dark background such as space. As the planet's face becomes more shadowed, more ambient light can fall upon the night side. Notice in figure 2 that the darkest part of the night side is directly adjacent to the terminator and light side. The most extreme example of this is found when the sun is behind the planet. In this case, the lightest part of the night side is in the center (see figure 3).

In deepest, darkest outer space there is not always ambient light to define the dark side of a world. Fortunately for the space artist, there are many planets and moons flying around. In a composition involving Jupiter, for example, one or more of the Galilean satellites can be placed behind the planet to illuminate the night hemisphere. If you are on a moon looking at a parent world, keep in mind that the major planet has exactly the opposite phase, seen from the moon, as the moon does when seen from the planet. If I stand on Triton and see a crescent Neptune in the sky, I can rest assured that anybody floating around the cloud tops of Neptune sees Triton as gibbous (see figure 4). So, if a planet is in crescent phase, the moon you stand upon will cast its light upon the night side of the planet (most moons are tiny and distant from their parent world, so don't overdo it!).

Now we turn to the illuminated side. You would think it would be simple: the closer to the sun, the brighter the surface is, right? Not quite. To figure all of this out, we must talk about the limb of the planet or moon. The limb is the edge of the disk which is against space. Objects which have a solid surface such as Earth, Mars, Ganymede, Phobos, and a basketball have what is called limb brightening. In this case, the toward the sun is the brightest part of the disk. This makes sense. But it doesn't work that way with planets which have cloud-covered visible surfaces like the gas Giants.
and Titan. These worlds have limb darkening. Just take a look at Jupiter. Under most lighting angles, in particular those where the planet is half illuminated or more full, the limb is a dusky blue, somewhat darker than the rest of the disk (except, of course, for the terminator). Limb darkening is an important part of portraying a gaseous world. It enhances the believability and mood of a painting. (The exception to the limb darkening rule—and there’s always an exception—is Venus. Although covered in clouds, it has limb brightening).

The final touches on a planet or moon involve the terminator (“Hasta la vista, baby!”). The terminator is the region where you will see the most topographic detail. On photos of cratered moons, craters look like dark or light ovals on most of the sunlit face. But the craters near the terminator begin to show deep shadows and highlights. In fact, on Jupiter’s moon Europa—the smoothest body in the solar system yet found—the only elevated terrain was seen at the terminator, where subtle ridges became apparent in the low sun angle.

These simple tips will help to give you some insight into how light behaves in nature. If you want to depict a planet realistically, these rules will give you a good head start.

In closing, I would like to quote a button which Bill Hartmann gave me: “It’s a small world, but I’d hate to have to paint it.” Happy painting!

New Books by IAAA Members
David A. Hardy

The January/February issue of Pulsar contained a (very complimentary—thanks, Mikey!) review by Michael Carroll of my new book, The Fires Within. But in fact mine was not the first book by an IAAA member to be published during the last year or so, so I would like to appeal to all members to ensure that any new publications are brought to the notice of our Editor. After all, if our own members don’t know about them, how can we expect them to sell!

May I ‘kick off’ by writing a few words about three books which I am proud to have in my own library. Oddly enough, like my own book (which is about volcanoes), none of these is strictly a book of space art. But all are most definitely of interest to space artists, and just go to illustrate how diverse are our members’ interests and talents.

Traum und Realität (Dream and Reality) was actually published a few years ago, but the artist, Gabriele L. Berndt, has joined the IAAA quite recently. This slim paperback records Gabriele’s work from 1976 to 1988 and contains very little text (just as well for most of us, since what there is is in German), but consists of about 45 pages of beautiful full-colour reproductions. Most of it is best described as fantasy art, but Gabriele has held three exhibitions at the Stuttgart Planetarium, in 1982, 1986 and 1989, and there is a section of realistic planetary landscapes and space scenes—all with a wonderful sense of atmosphere, light and texture. Other paintings are mystical, with standing stones, ‘crop circles’ and such, but all have a magical quality and, despite their subject-matter, a feeling of reality.

The controversy about ‘realistic’ and ‘swirly’ space art seems to have died down for the moment. Much of Gabriele’s Falls, I feel, into what Beth Avary calls ‘astrosurrealism’, and while I do have to agree with many of Bill Hartmann’s comments on ‘spacey art’ in a recent Pulsar, the IAAA would be much poorer if it did not include art like that of Gabriele Berndt. The example below is a blue ice-scape titled ‘Polaris’.

All IAA members must be familiar with the work of Bill and Ron, especially from their books The Grand Tour, Out of the Cradle and Cycles of Fire — and, of course, In the Stream of Stars. But, as with many of us, their interest in planetary geology encompasses the past as well as the future. Hence this stout, 260-page hardcover, which traces the formation and evolution of our planet.

The text is, as one has come to expect from Hartmann, accurate and readable. And not only does he provide his share of artwork, but he also proves that he is a very fine photographer, for scattered among the pages are little gems of colour photography — of Yellowstone, Bryce Canyon, Meteor Crater. . . . The artwork, by both artists, covers past impacts and disasters, the evolution of life, through the age of dinosaurs (here Miller excels) to modern times, and a glimpse of the future.

If I could change anything in this book, it would be to make some of the illustrations larger. There are no double-spreads, and few full-pages. This art really deserves to be seen as near to full-size as possible. But it is a book which should be on the shelves of every space artist.

Visions of the Revelation by Jay E. Adams & Michael W. Carroll, Foreword by Col James Irwin; 103 pages; The Donning Company, 1991; $29.95, plus $3.00 for shipping (USA).

It seems to me that most space and SF artists appear to find the grandeur of the universe, and the science which we think explains it, sufficient without invoking higher powers. Michael Carroll makes no secret of his deep religious faith; he is an elder at New Hope Presbyterian Church, San Diego. As we all know, he is also a very fine space artist, but throughout history much of the world’s great Art has been inspired by religion, and Michael shows that this can still be true today.

Jay Adams is a renowned theologian who has produced a new translation of this last book of the Bible, originally written in the first century. Carroll brings to life its apocalyptic landscapes, strange beasts, fiery battles and dreamlike visions. The space artist comes to the fore with showers of meteors and the ‘Moon turning to blood’. Some of the illustrations are actually details of others, but they work well in their own right, and are worth studying in close-up.

Whatever your own religious convictions (and it might be interesting if members wrote about their own feelings on this?), this book is well worth a place on your bookshelf.

Traum und Realität by Gabriele L. Berndt is available from the artist at Helsinkistrasse 68, D-2300 Kiel 1, Germany @ DM25.00 (ie. German Marks – an International Money Order is easiest), including postage etc.

The Fires Within: Volcanoes on Earth and Other Planets by David A. Hardy & Dr John Murray (Dragon’s World, 1991; 192 pages; £17.95) is available from Astro Art, 99 Southam Road, Hall Green, Birmingham B28 0AB, England. Please add £13.25 for Air Mail, £4.87 Surface — by I.M.O., please. It is also published in France by Editions Atlas, as Les Volcans.

Archives

There are 3 new archive pages enclosed with this issue, and about 6 more to come in future installments. The archives were started with the fact in mind that not all members would be able to participate in the workshops. With the archive catalog (which is still being perfected) you will get a good idea of the slides available from the various workshops or other interesting locations. The numbers on the catalog are interpreted below. If you have requirements not listed, please ask anyway as I still may be able to help you. To look at 8 slides at a time just send self-addressed stamped envelope with your request. The cost for mailing 8 slides in the U.S. is $.32 cents, in Canada or other countries the cost is .7 cents. I am always open to new categories and submissions of slides. Please do not keep slides for any longer than about 4 to 6 weeks. Thank you.

Location categories (first two numbers):

07 Alaska
06 Anza-Borrego Desert
04 California Coastal Rock Formations
02 Death Valley workshop
01 Hawaii workshops
05 Iceland workshop
03 Southwest workshop (Arches, Canyonlands, Goblin Valley)

Geological categories (second two numbers):

01 Alluvial Fans
02 Arches
03 Badlands
04 Buttes
05 Calderas
06 Canyons
07 Caves
22 Cliffs
08 Clouds
09 Craters
10 Dunes
11 Faults
12 Geysirs
13 Glaciers
14 Ice Fields
27 Ice Formations and Icebergs
25 Lakes
28 River Beds / Dry Washes
24 Misc.
23 Mountains
16 Moraines
17 Mud Formations
18 Mud Pots
19 Salt Pans/Fields
26 Steam Vents
20 Volcanoes
21 Waterfalls
28 River Beds / Dry Washes
SOME NOTES ON DRAWING ELLIPSES

Joel Hagen

Clean ellipses are needed in astronomical art to render gas giant planets, rings, terminator lines, and so on. Most people are familiar with the two focus methods of drawing an ellipse with a string around two pins. Many people are not as familiar with the procedure for arriving at a meaningful spacing for those pins. This simple method may be of help.

Often it is important to draw a particular degree ellipse, for example to accurately represent the oblateness of Jupiter, or the open tilt of Saturn’s rings from Igpetus. A circle is a 90 degree ellipse and the angle of the ellipse decreases as it tilts down toward a straight line, 0 degrees. The ellipse has a major axis and a minor axis. The ratio of the lengths of these axes is:

MINOR AXIS EQUALS
MAJOR AXIS TIMES THE SINE OF THE ANGLE

In the example figures, I am drawing a 45 degree ellipse with a major axis of 4 1/2 inches. The sine of 45 is .71. 4.5 inches times .71 is 3.18 or a little more than 3 1/8 inches for the minor axis.

Lay out the major and minor axes at right angles within a box of the same dimension as in figure 1. With a compass centered on the minor axis and the bottom border as shown, strike a half circle arc with the diameter equal to the major axis. The two points at which the arc crosses the major axis center line are the two foci for the ellipse.

Put a push pin in a focus ( A ) and loop thin, strong string around it, stretching the loop taught past focus ( B ) to point ( C ) on the border. Carefully knot the loop so that stretched taught, it is exactly length (AC) as in figure 2. Put a second push pin in at focus ( B ) and insert pen or pencil in the loop. Keep the loop taught and draw the ellipses, Figure 3.

In the Death Valley issue of PARALLAX, I outlined a method for programming ellipse drawing in BASIC on a home computer. This technique can be used with a printer to reproduce templates. I make planet templates using the pin and string method just described to produce cheap, stiff plastic reusable air brush templates.

I lay out the ellipses as just described on the back of a plastic FOR SALE sign from the dime store. Instead of a pencil, I scribe the ellipse with a stiff needle. Start gently and wear your way through the plastic in a series of passes, rather than trying to force through it quickly. Remove burrs gently with fine sandpaper, note angle and dimension on the plastic for future reference, and hit the bottom of the template with a light coat of a spray adhesive.

Let the adhesive dry COMPLETELY, then press it on your jeans a few times to make sure it isn’t too tacky. It will now stick to your painting, but not so badly as to pull up paint. I airbrush all colors and terminator with the template in place, then touch up edges on the dark side where needed.

Minor Axis

Major Axis
Exhibition Update

Beth Avery

ART OF THE COSMOS

The official opening of the Art of the Cosmos exhibition at the Hayden Planetarium in New York City was February 20th. I flew out for the event and stayed with Dennis Davidson, the planetarium artist and person responsible for hanging the show. It looked great! The paintings were well lit with a caption placed next to each that displayed the artist’s name and country, date of execution of the work, its media, size and a short description of the content. Most of these were written by Dennis from information provided, for the most part, by the artists.

Among the artists attending the show were Bob Eggleton, Anne Sharp, Brian McGovern and Mark Hamel. Jean Michael Joly was represented by his agent, Charles Ackerman.

Joel Hagen and Andy Chaikin arrived to see the show the next day, and we were taken on a “behind the scenes grand tour” of the American Museum by Dennis. We were introduced to Steve Quinn, the assistant manager of exhibitions, who explained how some of the famous diorama artists achieved some of their magical effects.

A video and film production group headed by Margaret Kerns took footage of the exhibit and interviewed a number of artists who attended the opening as well as the Chairman of the Hayden Planetarium, William Gutsch. The plan is to put something together to solicit funds to produce a really nice video about the show and Astronomical and Space Art in general.

I will return at the end of the month to do an interview at the planetarium with Voice of America. They will find out about space art in outer Mongolia! If it turns out well, perhaps I can send it around to other stations to get some publicity for us.

The exhibit is now being seriously considered by the Arts and Science center in Statesville, North Carolina for January-February, 1993.

CONTACT IX 92

The Contact conference was a real treat. IAAA members showing their work were Carter Emmart, currently working at NASA Ames, Patricia Davis, a number one “best seller” at many science fiction conventions, Lynette Cook, the Morrison Planetarium artist and curator of an exhibit of space art to be held there in May, former IAAA member Garret Moore, a free lance commercial and fine artist, and yours truly. Other invited artists included Wolfgang Gersch, Nicolai Larsen and Stuart Shepherd.

Joel Hagen gave a demonstration (“Mars and Beyond: Landscaping in ComputerSpace”) of his computer techniques showing how he achieves fabulous space landscapes in stills and animation on the Amiga.

Other noted speakers included Carol Stoker of NASA Ames, “Telepresence in Space Exploration, Chris McKay of NASA Ames, “Mars: Its Once and Future Life” and “Robotics/Artificial Intelligence: A Scientist’s Perspective”; just to give you an idea of the symposia.

LIGHTSPEED the extraterrestrial Gallery

A new gallery devoted to space art! Located in old downtown Titusville - Space City, USA. Owner Jim Dolan says “It’s my goal to be the place to shop for appropriate decor for the local aerospace offices, meeting rooms, lobbies, etc.”

He will accept quality work on a consignment basis retaining a 40% commission.

Call: 407-268-0505, or write
The Lightspeed Gallery,
110 Julia Street, Titusville, FL 32796.
A note to the Editor...

I found Dennis Davidson's article on 'Gallery Strategies' quite interesting. However, I'm sure that Dennis won't be surprised if I enter a plea for future writers of such articles to remember that the IAAA is 'international'. It may not always be easy to find out how other countries work, but even an occasional sentence such as 'American galleries do this, and European galleries may operate on a similar system' will at least show the rest of us that we are not forgotten!

David A. Hardy

Calendar

1992
September 14 - 18
Ghost Ranch Workshop - See Insert

1993

1994
January 1
New Editor for Pulsar and Membership Coordinator

Please... if you know of an interesting event in your area please send it in to the calendar. I know that several people would liked to have attended the Astronomical Society of the Pacific Conference but didn't know about it. Obviously it is too costly for most of us to join more that a couple of organizations or even to subscribe to more than a few magazines. If you are a member of an astronomical society or related groups or subscribe to applicable magazines (i.e. Planetary Society, Astronomy, local amateur astronomy groups) please send in any information on events in your area!