

ANNOUNCEMENTS!

DUES ARE DUE!

Yes folks, it's that time of year again... **dues** time. That'll be \$40, or 26 pounds sterling for European members, sent to either Dave Hardy or Dale Darby (addresses to the right). Think of all the benefits of membership - the friendship, the listserver, the camaraderie, the art news and tips. And don't forget the Pulsar! (Who could? ;)) If you don't send in your dues, this could be your **last** issue! (The horror - the horror!) So what are you waiting for? Send it in! 'Tis the season to pay for next year... fa la la la la la, la la ti dAAA!

Web Surfin' Sites to check out :

- <http://mpfwww.jpl.nasa.gov/mgs/index.html>
- <http://macworld.zdnet.com/pages/october.98/Feature.4481.html>
- http://www.jpl.nasa.gov/ice_fire
- <http://galileo.ivv.nasa.gov/news.html>
- <http://www.geocities.com/Hollywood/Lot/1642/KellyFreas.htm>
- <http://www.cnn.com/books/news/9810/05/apollo.bean/index.html>
- <http://www.twins.proweb.co.uk/space.htm>

spacefl.htm

Source: <http://solar.cini.utk.edu/~mwade/>
 crew capsule that was launched 8 times.
 C. The Vostok V3A, the Soviet one man
 stranded lunar astronauts.
 Ship, a NASA design for rescuing
 B. The Gemini Lunar Surface Rescue
 or warheads.
 design intended to launch either satellites
 A. The hypothetical German A-11, a
Space craft answers from page 5:



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ASTRONOMICAL ARTISTS**

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Dec 98 / Jan 99

The Official Newsletter of the



International Association of
Astronomical Artists



Meteorologica by Eric Viktor. Floating high in the clouds we find... a planet and moon? Talk about a couple of "world" record hail stones! Eric's piece shows that *surrealistic* space art can be as eye-catching as realistic space art. More inside....

Editor: Jon Ramer

IAAA Website: <http://www.iaaa.org>

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METEOR SHOWERS?

By Don Davis

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Announcements

-- METEOR SHOWERS CONT'D --

in the telescope dome working when I heard the others exclaim in unison, "Wow!" They had seen a -5 magnitude meteor which was visible for 140 degrees of flight. It left a train that lasted for 10 minutes, getting kinked by the upper atmospheric winds. The display prompted us to develop our own meteor nomenclature. 'Puff Daddies' were the ones that went pffft. Then we had the 'Whoas' 'Double Whoas' and the 'Triple-Double Whoas.'

The Western United States, most of which was cloudy, was the last region to see the spectacular phase of the shower. Many got a look through holes in the clouds, a few such as myself drove out from under the them.

Los Angeles was socked in under a thick drizzly fog. I drove Northeast through the mountains to the Lancaster area, and finally out from under the low coastal clouds. Several times while driving I saw fireballs in the periphery of my vision. Finally I found a decent exit, in a cold and reasonably dark vista point not far from Lancaster.

The wide faint stretch of Milky Way near Orion was clearly seen, and Leonids were everywhere. All one had to do was look up and shortly a bright streak would grab your attention, and when you looked away as often as not you would immediately see another. In all perhaps 200 meteors per hour were seen between 4 and 5 am Pacific time on the 17th. At times I saw a meteor every few seconds, other times a few minutes would elapse between sightings.

Nearly half of all the meteors I saw were very bright, most of these leaving persisting trails. Some of these brighter fireballs were very short, others streaked across a quarter of the sky. Once I saw two bright but short trail producing ones appear simultaneously near the radiant point in the head of Leo, spreading 'down' from each other and diverging at about a 30 degree angle to each other. On two other occasions I saw a meteor, then another, paralleling but not exactly following the path of it's immediate predecessor.

Once I saw a bright one, then a moment later a faint slow moving meteor roughly paralleling the path of the bright one but going in the opposite direction!

A couple were very bright, perhaps -10, one along the distant horizon ended in a bright gold burst that made the sky nearby glow. A couple ones whizzing overhead also tended to appear golden at their bright tips, with a cool gray trail initially remarkably bright then quickly fading, but visible for at times several minutes. At one time I watched two such glowing trails at once twist and spread among the stars while other meteors flashed by. I saw one very slow moving second magnitude meteor near the radiant point, like a swiftly moving satellite winking on and off. The bitter cold wind steadily picked up, and the crescent Moon rose above the horizon along with the first light of dawn.

The apparent ambiguities in the model of the swarms encounter with Earth rendered it useless to travel to some other continent to try to catch the best moments of the storm. The possibility exists that this was only the prequel to a larger display next year! It is suggested fewer fireballs but many, many more smaller meteors may be seen. A preliminary reshuffling of the data with next year in mind suggests Western North America may be favored, but we know how such predictions can go! (*Anybody interested in a workshop then?... Ed.*)

From the Editor-

Hi Gang. Seems that there are more and more kudos every month! Is this great or what? The artwork featured in this issue is something a little on the different side. Space... but not quite as "normal" as you think. The big buzz in the past month was the annual visit of the Leonid meteor shower. Got a great story from Don Davis on that plus some other tidbits below. Next time it'll be **HARDWARE**. See you then....

Oh, by the way - Happy Holidays!

Jon!

Table of Meteor Showers

Shower	Period of Activity	Maximum	ZHR	Velocity (km/sec)	Characteristics
Quadrantids	Jan 1 - 5	Jan 3	120	42	bluish
April Lyrids	Apr 16 - 25	Apr 22	15 (90)	48	rapid, persist. trains
Eta Aquarids	Apr 19 - May 28	May 5	60	66	source Halley's comet
Arietids	May 29 - June 19	June 7	60	37	strongest daylight shower
d-Aquarids	July 12 - Aug 19	July 28	20	41	few trains
Perseids	July 17 - Aug 24	Aug 12	>100 (400)	60	very fast, 45% persist. trails
Orionids	Oct 2 - Nov 11	Oct 21	20	66	no common color
Leonids	Nov 14 - 21	Nov 17	>20	71	fast, green trails
Geminids	Dec 7 - 17	Dec 14	110	35	rapid, yellowish
Ursids	Dec 17 - 26	Dec 22	>12 (90)	34	typically faint



One Small Mistake by Chris Butler

Free from the quarantine, our intrepid lunar astronaut approaches his shiny red corvette, eager to get home to his wife. "Now where the heck did I put those keys?...."

Profile: Leland Long Artwork and amateur astronomy have been my main interests since grade school. Chesley Bonestell was a major influence on what I wanted to do in art. I used money from my newspaper route to buy a book he illustrated titled "The Exploration of Mars." My mother and stepfather were professional cartoonists who worked on comic books and animated cartoons. They encouraged my art training through high school, where I sold my first astronomical painting in a high school art show. During college my majors were: Engineering, Art, Physics and, Mathematics. In 1993 I received my BA in Mathematics at CSUN. To me, two major goals of astronomical art are truth and beauty. I like to immerse myself in researching a design, do preliminary drawings, sometimes computer aided, and consult with the customer to produce the painting they need. My past commissions include murals of the Grand Tour of the Solar System (the mission supplanted by the Voyagers), a 35 foot high planetscape on a bookstore in Santa Monica and gray scale illustrations on continental drift in Vertex Magazine. I got into graphic sign art in the 1970s and in the 1980s learned to use computer graphics systems. This background in sign art, along with the computer graphics experience, led to a teaching career. Currently, I teach one course titled computer aided design technician, and another for high school G.E.D. and adult basic education to adult inmates of the Los Angeles County Jail system at North County Correctional Facility. Joining the IAAA has proved to be one of the best experiences of my artistic life. I am grateful to Kara Szathmary, Dale Darby, Michael Carroll, Joy Day and others whose responses have proven a treasure trove of valuable advice and information from others who have interests in art and astronomy.



Celestial Awakening
by Lynette Cook
Lyn's classic and exquisitely detailed orchid radio antenna image is a perfect example of combining everyday objects to create a different yet striking work of space art.

WORKSHOP TIME!!

The very interesting listserver discussions on seeing a landscape with ones own eyes makes this an opportune moment to make this announcement:
For many months, both the previous and the current Board have been trying to organize a new IAAA Workshop in Iceland -- site of the meeting between western and then Soviet artists ten years ago, in 1988 (and my first IAAA workshop -- an awesome experience, and I mean it!). If you want the chance to see, sketch and photograph the kind of landscape that Bill Hartmann so eloquently described (albeit in not such hot conditions, though Iceland is nothing like as cold as its name implies, much like an English summer really...), this is IT.
The dates have given us problems. As you know, there is a total solar eclipse in the UK/Europe on 11 August 1999, the Apollo anniversary is in July, which many of you will want to celebrate (though where better than the place the astronauts trained - ?). The dates most favored are 28 Aug to 5 Sep 1999 (Sat to Sun), but we need to gauge the interest from members in this. So please, if you would be interested in attending this workshop, inform our chairman, Kara Szathmary at kbaszk@champlaincollege.qc.ca with a cc to me at the address on the back cover as soon as possible. Results will be announced shortly.

Yours - David A. Hardy

ART TIPS

This month: cleaning up - from the list server.

A bar of fels naphtha soap will remove oil paint from just about anything. A little elbow pressure and some of this soap can remove oils from clothing quite well. It is also good for cleaning brushes.

Another cleaner is "Goop" and its relatives - the hand cleaner used by engine mechanics. You can take a brush thought clean and pull out color for 5 minutes. As an added plus, hand cleaners usually contain lanolin, which seems to be good for better brushes.

A quick method of cleaning brushes when glazing etc.. Rinse the brush in turpentine, wipe it off, then remove the slow drying turps by rinsing the brush in a cup of acetone, or other rapidly evaporating solvent. If the brush is again wiped off and its handle twirled between the palms or flicked on a cloth, it will dry at once, ready for the next application. (Note: The brush still needs to be cleaned properly before storage.) You should only do the above in a very well ventilated room naturally.

Kudos Korner

- Kudos to Lynette Cook for her great meteor image in November's Astronomy magazine
- "Well done" to Don Dixon's new view of the Milky Way and companions in the October "Scientific American"
- Dana Berry had some nice digital images of the galaxy, star birth, etc., in the November issue of DISCOVERY magazine
- Many kudos to Dave Hardy and Mark Garlick for their images in ASP's Mercury magazine. Dave also wrote the article on space art. Great job guys!
- Here's to Lynette Cook again her recent three images in Sky and Telescope magazine, and kudos to Kelly Beatty for using them. Lynette's cover piece is OUTSTANDING. Not to be outdone, Don Dixon has a spectacular interior piece too. WAY TO GO EVERYONE!
- Andy Chaikin did two commentaries on NPR on John Glenn's shuttle flight including an upbeat tribute to the progress in spacecraft. Andy was splendid, he's becoming quite a historian of the space program!
- Astronaut member Alan Bean has been on CNN talking about his illustrated book titled "Apollo." An excellent books folks - go get one!
- More congrats to Don Dixon for a cover and great interior art on the November 1998 Scientific American
- The latest issue of GEOLINO, a German children's magazine, contains an article illustrated with art by no fewer than **four** IAAA artists: Bill Hartmann, Ralf Schoofs, Pat Rawlings and David A. Hardy. Talk about collaborating!
- Halton Arp has a new book out titled "SEEING RED: Redshifts, Cosmology and Academic Science." Jess Artem gets a mention in it.: "In 1990 an artist friend in Tenerife, Jess Artem, mentioned to me that the Titius-Bode law expressing planetary distances from the sun obeyed quite well a series based on the preferred redshift of quasars"...
- The first annual Carl Sagan Award was given to our very own Bill Hartmann for communicating science to those of us without PhDs. Congrats, Bill!

Profile: Paul Hoffman

I've been a Space Art fan since the 1950's; previously a designer for stage and television; and currently a computer software designer & artist. I have done some Space Art (on computers) since early '80's - but my recent work is "live" 3-D in VRML. I got involved in January of 1997 in a whirlwind (3-month) volunteer project to create a VRML journey through the Solar System for the children of Ireland. The volunteers were about 20 VRML "nuts" from around the world who never met during the whole project until two of us put it all together in Ireland at the end. It turned out to be a fictionalized story about a future emigration from Earth, with some scenes playing like a movie, and some having extensive exploration possibilities for the viewer/user. I ended up basically being responsible for just about all the planets (and consequently their satellites, too), scenes on Earth's Moon, and ultimately the Art Direction and computer-programming integration of the whole thing. (It took up at least 300 hours of my time, including all my vacation time that year, and at least 100 hours since trying to get it in shape to cut a CD-ROM).

It was installed in the Kerry County Museum, Tralee, from April to November last year, and we were honored to have Neil Armstrong chair the opening of the exhibit (Ireland's first on the subject of Space Exploration).

See: <http://pluto.njcc.com/~paulsam/vrmltwo.html> which has some bits and pieces. It's called "Outward from Earth: the Journey of the Jeanie Johnston II" (nicknamed "IrishSpace" by the team).

Measure of a Galaxy by Jess Artem

So, what's the *best* way to measure distances in a galaxy? Who needs light years and cepheid stars? Do it the "handy-man" way - pull out your trusty tape measure!



-- METEOR SHOWERS CONT'D --

sky rate uncorrected for the height of Leo above the horizon. It may be an underestimate, as we are mere professional astronomers and are not used to this kind of activity - we feel that we may be missing a number of faint meteors (less than 3rd mag). The number of bright meteors and fireballs is astounding. Every couple of minutes you get a bright flash behind you and you turn around to see the ion trail fading. The brightest meteors have bright green trails, often with bright red heads. The rate still seems to be increasing - we've just gone outside the control room of the telescope and we are approaching one meteor per second. It looks like rates over the Eastern US may be very high. However the zodiacal light is now quite bright, so twilight is approaching."

The densest core of the column of debris brushed against the Earth somewhere in the Atlantic at about 0600 hrs UT, some 16 hours before the widely circulated prediction. In retrospect this was well within the uncertainties known to exist in such forecasts. The most intense moments of the meteor storm flared and died quickly, by the time North America was reached it had settled down to a still impressive hundreds per hour. Unfortunately much of the United States was clouded out, but here and there excited reports were added to the gathering wave of internet accounts.

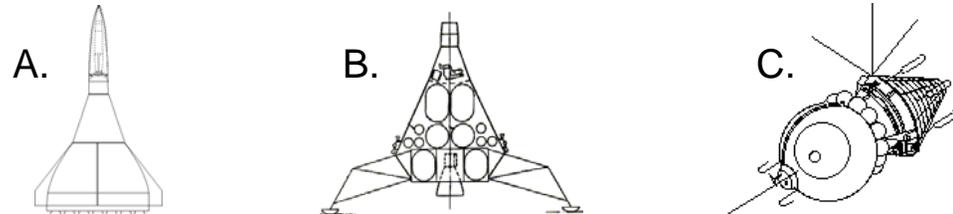
From NW North Carolina : An observer reported "Between 0730 - 1030 UT I logged an average of well over 100 Leonids per hour that exceeded +1 mag. The majority were -1 or better and nearly all left short ionized trails. I didn't even bother to count the fainter meteors! The brightest observed was estimated at -8 and just happened to be coming straight out of the radiant... it was like someone setting off a flashbulb in the sky! No apparent motion - just a blinding flash! But the highlight was when I took a 'time out' from counting and sneaked a peek at M-42 with my 20 X 125 binoculars. Suddenly a very bright Leonid flashed through the middle of the field! I could see its ionized trail for about 30 seconds after its passage... just like a greenish arrow straight through the heart of the nebula!"

From 0830 UT to 1030 UT: "Over 200 meteors were observed over two hours through about 10% spotty cloud cover. At least 10 left trails lasting up to 30 seconds. Approximately 15 ended with extremely bright flashes which, when happening behind me, would lit up the landscape like lighting."

As North America rolled into the storm, accounts came in from the scattered clear spots, such as northern Texas: "Was watching early. Amazingly, activity started at 12 midnight on the nose. These first meteors to me were the best as they seemed to stream up from the horizon traveling nearly half the sky."

"Leonids was AWESOME in north-central Tennessee! We started watching at midnight, saw 66 meteors the first hour, mostly very bright and with long tails... The most SPECTACULAR event of our viewing came at about 1:30 am, when suddenly at least fifteen meteors AT ONCE shot out of a central spot in the sky. It was like it was raining! There were maybe five or six meteors side by side, with a second volley of five or six right behind them, and then a third, they just Poured out of the sky. Immediately afterward, there were seven or eight meteors all over the sky, one right after another (some simultaneously). It was incredible!"

From Lowell Observatory, Flagstaff, Arizona: "At 12:25 AM (0725 UT), I was



HOW "SPACE SMART" ARE YOU? Can you identify the three spacecraft above? One was hypothetical, one was actually on the drawing boards, and one flew in space. Answers on back cover.

Starfishing by Lynette Cook

Let's see... should that be the 200 pound tested line or the "large-as-a-small-asteroid" tested line? Anybody seen the comet flavored bait?



Continued on page 11

Astronomical Feature of the Month :

-- METEOR -- -- SHOWERS --

The Great Leonid Shower of 1998

By Don Davis

The Leonids are the 'holy grail' of the meteor showers, a once in a 33 year passage of the Earth through a band of gritty rubble spreading from the comet Tempel-Tuttle out along the orbital path. More sparsely populated cometary



Terrestrial Formation by Michael Boheme.

Is it just a blue-green pebble, or have you been on Mars too long and are imagining things?

orbits are common, with Earth passing through a dozen or so of these yearly. meteor showers accompany each passage, named for the constellation they appear to emerge from (see page 2).

A 33 year cycle of massive periodic showers was recognized then anticipated, with uneven performance lulling most observers to expect little more than one of many annual showers.

The sight that greeted Western U.S. observers in November 1966 will be carried in their minds as long as they live. Rates of 1800 meteors per MINUTE were reported! It must have looked like driving fast in a snowfall with your high beams on! The storm was intense but brief, the peak lasting less than 2 hours before decaying swiftly to more traditional levels.

A composite picture of the orbit of Tempel-Tuttle in relation to the yearly path of the Earth was constructed using the accumulated observations of the last few cycles, modeling the situation enough to suggest the Asian Pacific rim regions might be facing the dense stream during the critical 2 hours, thought to be due at about 1943 Hrs UT on the 17th.

The International Meteor Organization issued an 'Alert' circa 0900Hrs UT on Nov 16, stating that "a rapid rise in activity is in progress".

Before dawn that morning numerous brilliant fireballs were seen in the western U.S., some rivaling the brightness of the full Moon! An account from the San Diego area read: "The trains (of the numerous fireballs) lasted quite long for a lot of them... a -15 and a -12 had persistent trains that were of magnitudes of around -8 for a few seconds it seemed. They snaked and twisted all over the place. It was hard to keep count of their duration because often another fireball would show up. The -15 occurred above and behind us...the stars totally disappeared and the sky looked like daylight blue for a second or two. It was pure old excitement."

By 0800 UT on the 16th, reports came in from Mongolia of numerous fireballs, with brightnesses of -8 to -16, bright enough to make moving shadows!

As Europe began to be exposed to the shower, 1100 UT, many echoes were detected on the FM band by someone listening in France. Meteor trails can reflect distant FM stations like the ionosphere routinely does for AM radio waves, bringing clear fragments of music and speech out of the static.

At about that time, an observer in Jordan reported seeing meteors despite wretched observing conditions. Observers lucky enough to be under clear skies near Glasgow, Scotland, and in Northwest Europe were treated to a fireball rich shower mounting hourly in intensity.

The Cosmonauts on Mir observed the event, from orbit wide regions of the night side of Earth glimmered like a carpet of disturbed fireflies in a midwest field, each a dying flare of comet dust slamming head-on into the atmosphere.

The dark Atlantic seas danced with the reflections of the frenzied sparks careening overhead, with the only witnesses aboard ships and aircraft until the Canary Islands were exposed to the incoming stream. By this time, 0Hrs UT on the 17th, the hourly count of meteors visible at any one place had risen well into the hundreds, and still climbing! Alan Fitzsimmons sent a message, 'on behalf of a bunch of happy astronomers': "Dear All, We're at the summit of the island of La Palma in the Canary islands, at the UK Isaac Newton Telescope. We are having an amazing display here. From doing 2-minute counts, we were seeing roughly 1000 meteors per hour at 03:30 UT, climbing to roughly 2000 per hour at 04:30 UT. These are estimates of the all

Continued on page 8