

ANNOUNCEMENTS!

FYI: "The Artist's Universe" exhibit is now coming off the walls at the California Academy of Sciences. If you didn't get out there to see it - and meant to - well it's too late for that. Now you'll have to go to Gainesville, Florida to see it, as the work is being shipped to The Florida Museum of Natural History for its next venue.

Web Surfin' Sites to check out :

- hubble.stsci.edu/steiner/current/media.shtml
- members.aol.com/jabergeon/astronomy.html
- dmz.org/Arts/Online_Galleries/Futuristic
- user.tninet.se/~stb444s
- directory.netscape.com/Arts/Fine_Arts/Visual_Arts/Painting/Space_Art/
- samadhi.jpl.nasa.gov/
- mars.jpl.nasa.gov/mgs/target/CYD1/index.html
- www.biospherics.com/mars/spie/spiehtml.htm
- www.alexart.com
- www.globaleffects.com/spacesuits.html

A SOFTWARE Bonus from page 4:
 A: Gort from "The Day the Earth Stood Still."
 B: Robbie the Robot from "Forbidden Planet."
 C: A Dalek from the long-running British television series, "Dr. Who."

HARDWARE Bonus from page 9:
 A: The Soviet one-manned LK Lunar Lander. Full scale engineering models were built and three even launched into Earth orbit in 1970 & 71.
 B: The Soyuz 7K LOK Lunar orbiter. Never launched but fully constructed, it was planned to be boosted on the N-1.



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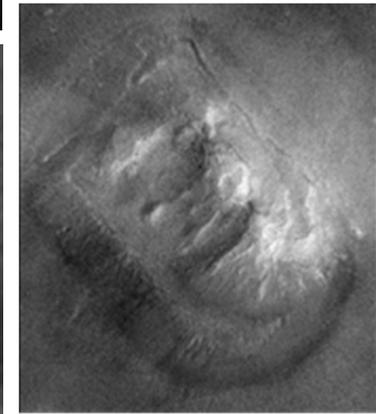
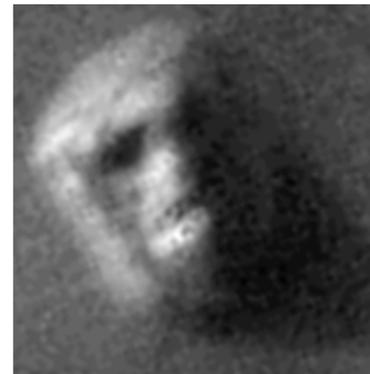
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Apr / May 99

The Official Newsletter of the



International Association of Astronomical Artists

THERE ARE ALIENS ON MARS! THERE ARE ALIENS... ON...

Oh... uh... well, umm... never mind. Anyone want a nice UFO picture?

Left: Mars Global Surveyor photo of the "happy" Galle Crater on the eastern side of the Argyre Planitia basin. Below: The "infamous" Viking photo of the Cydonia region showing the "Face on Mars." Next to it is the MGS image of the same formation, proving the Viking image a trick of light and shadows... unless... NASA is in on the conspiracy and these photos are faked! Yeah! That's the ticket! It's a conspiracy!! (NASA images)

Editor: Jon Ramer

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

IN THIS PULSAR...

KSC - Here we come!

From Jon Ramer

Profile: Angela Manno

Kudos Korner

Is Someone Out There?

From The SETI Institute

Art Tips -

From Bob Eggleton

Profile: Doug Czor

Profile: Tom Miller

Astronomical Feature of the Month -
SETI

From The SETI Institute

Announcements



From the Editor-

Hi Gang. All the list server discussion about alien life make the theme for this Pulsar rather obvious. It's a shame this issue isn't in color, these alien life forms are spectacular! Next issue we'll have the report on the KSC workshop and binary stars. Until then... *You!*

Double Sunset by Joe Bergeron

Twin stars make a beautiful "suns-set" on a beach with alien plant life.

Astronomical Feature of the Month :

-- SETI --

While interest in the question of extraterrestrial life is at least as old as historical civilizations, the modern SETI era can be defined as beginning in 1959. Cornell physicists Giuseppe Cocconi and Philip Morrison published an article pointing out the potential for using microwaves to communicate between the stars.

A young radio astronomer, Frank Drake, had independently reached the same conclusion, and in the spring of 1960 conducted the first microwave radio search for signals from other solar systems. For two months Drake aimed an 85-foot West Virginia antenna in the direction of two nearby Sun-like stars. His single-channel receiver was tuned to the "magic" frequency of the 21 cm (1,420 MHz) line of neutral hydrogen, a spot on the radio dial also favored by Cocconi and Morrison because of its astronomical significance. While he didn't detect any signal of extraterrestrial origin, Drake's Project Ozma spurred the interest of others in the astronomical community, most immediately the Soviets.

In the 1960's, the Soviet Union dominated SETI, and frequently adopted bold strategies. Rather than searching the vicinities of nearby stars, the Soviets used nearly-omnidirectional antennas to observe large chunks of sky, counting on the existence of at least a few very advanced civilizations capable of radiating enormous amounts of transmitter power.

During the 1970's, many radio astronomers conducted searches. Some of the efforts, employing improved technology, have continued to the present time. Foremost among these are the Planetary Society's Project META, the University of California's SERENDIP project, and a long-standing observing program at Ohio State University.

SETI programs were established at NASA's Ames Research Center and at the Jet Propulsion Laboratory (JPL) using a dual-mode strategy for a large-scale project. Ames would examine 1,000 Sun-like stars in a Targeted Search, JPL would systematically sweep all directions in a Sky Survey. In 1988, NASA Headquarters formally adopted this strategy and funded the program. Four years later observations began. Within a year, Congress terminated funding.

With NASA no longer involved, both researchers and interested members of the public saw a diminished chance to answer the profound questions addressed by SETI. Private funding has taken up the challenge.

Project Phoenix will concentrate efforts on that component of the NASA SETI project known as the Targeted Search. Its strategy is to carefully examine the regions around 1,000 nearby Sun-like stars. Project Phoenix is orders of magnitude more comprehensive than any experiment yet performed.



The famed Arecibo message beamed into space in 1974.

Profile: Tom Miller

My interest in "otherworldly matters" began as far back as I can remember. My brother Ron

and I were very fortunate to have a father that was a science fiction film buff. Our Saturday afternoons as children were whiled away at the matinee double features at the Esquire Theater in Columbus, Ohio. My earliest remembrances are of astronauts with blood rust, killer shrews, Robby the Robot and iguanas with fins glued to their backs. I was equally fortunate to have a brother who was a Jules Verne fan from the very beginning as well. On one afternoon we sat through 3 consecutive showings of Disney's 20,000 Leagues Under the Sea.

After many years spent under the informal flickering tutelage of Ray Harryhausen and Toho films I made the decision to go to art college. Ron and I attended the same school, the Columbus College of Art and Design. After receiving my B.F.A., I went on to become an art director for Larry Flynt Publications (yes, THAT Larry Flynt!). Not with Hustler however, but with Ohio Magazine. This was Larry's attempt to go "respectable." After my time there my wife and I moved to the East Coast where I worked for several different firms. These included a T-shirt firm where I learned to do typography design and airbrushing, a children's book company and working with Ron forming Black Cat Studios together. During this time I worked with several planetariums in a freelance capability, including The Maryland Academy of Sciences, the St. Louis Science Center and the Smithsonian among others.

We moved back to Columbus for my wife to pursue a master's degree in technical writing. Four years and two kids later she had a second degree (along with her first in creative writing) as an Industrial Systems Engineer. We went to Cincinnati when she was hired by GE Aircraft Engines. Two more kids came along and I was hired as the creative director Ral Partha Enterprises, a manufacturer of miniature figures for Dungeons and Dragons. During this time I continued to freelance for planetariums and publishers. I (and Ron) worked on a 3rd, 4th, 5th and 6th grade science textbook project for Silver, Burdett and Ginn. These books are used in my kid's school now and they are thrilled to see their dad and uncle's paintings when at school.

For the last three years I have been working as the art director for PyroTechnix, Inc, which used to be a division of Sierra OnLine Software. Sadly, Sierra did some "reorganizing" and PyroTechnix is no more. I'm now back to free-lancing. My experience with programming has given me a chance to explore the world of realtime 3D animation and cinema creation. Although intriguing, I doubt that it would ever fully replace painting for me.

I am also participating in NetScape's Open Directory Project. This is an attempt widen their database by having individuals participate as editors for different topics and maintain those sites. Information can be found about this project at :<http://directory.netscape.com/about.html>. I am currently the editor for a section on Space Art. It is my function to go out and start linking topical web pages to this database. If any of you want your site (or one you have found) listed here please direct your web browser to:
http://directory.netscape.com/Arts/Fine_Arts/Visual_Arts/Painting/Space_Art/.

My editor name is listed at the bottom as: tomokato. Click on it to send me e-mail or use the "add URL" button to send me a web site to be added to the Space Art category. Thanks!



First Life by Dale Darby

Many scientists believe that forming the building blocks of life is an easy process and that life itself is very common across the Universe. The step from building blocks to living molecules is a big one though. Here Dale shows primitive algae in the primordial ocean of a distant world.

HI HO THE DAIRY-O, TO KSC WE GO!

The time is almost here! Fifteen lucky artists are going to Kennedy Space Center for the next great IAAA workshop. The workshop will start with a bang with the viewing of a Delta II launch on 15 May and end with a bigger bang from the launch of STS-96 on May 20th. Between the 15th and the 23rd of May, members of the IAAA will be the guests of honor at painting displays in Spaceport USA (the tourist center of KSC), and the Astronaut Hall of Fame. There will also be tons of tours to check out the hardware and magic of America's space town, not to mention lots of fun and frolic with fellow space artists! Plans include seeing the ISS construction facility, the launch complexes, the shuttle landing strip, and the Saturn V/Apollo tourist complex, just to name a few. We're all set for a week in Florida - so look for a full report in the next issue of the Pulsar!

A "Software" Bonus...

Can you identify some of entertainment's "finest" extraterrestrials?

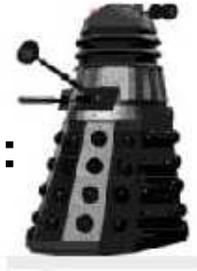


A:

B:



C:



Profile: Angela Manno Angela is a returning member who has been a professional artist for the past 20 years and is known for her pioneering work combining contemporary western art forms with ancient, non-western forms of expression.

A graduate of Bard College, Manno studied art at the San Francisco Art Institute, Parson's School of Design and in private tutorials under master artists of media little known in the west. Recognized as a contemporary master of batik, the ancient medium of textile design, she was trained by renowned Indian artist, the late Jyotirindra Roy, in a technique which transformed this ancient craft into a medium of fine art. She is also an accomplished fresco and plain air landscape painter and a practitioner of the ancient liturgical art of Byzantine-Russian iconography.

A two-time grant recipient from the Xerox Corporation, Angela has had her work featured in 20 solo and over 70 group exhibitions. Distinguished venues to exhibit her art include the Smithsonian Institute, the National Museum of Women in the Arts, the American Museum of Natural History, and various museums from Mexico City to Moscow.

In 1988, Manno was commissioned by NASA to commemorate the U.S. return to space flight with the launch of the space shuttle Discovery, the first after the Challenger accident. She is the only female visual artist to have been selected for this honor. Her artwork for this assignment has toured throughout the United States and is part of the permanent NASA fine art collection at the Kennedy Space Center.

Angela's highly acclaimed art series, "Conscious Evolution: The World At One" was viewed and lauded by over a quarter of a million people during a one-woman, international tour, and has been selected for the Smithsonian Institution's permanent fine art collection. Her 13-minute videotape based on this series will become the basis of a curriculum for school children.

Ms. Manno's art has appeared in numerous publications including Newsday, The Palm Beach Post, The Artists Magazine, New Age and Interior Design and is also featured in two coffee table books, Visions of Space and In the Stream of Stars: The Soviet/American Space Art Book. Her work is represented in the Archives on Women Artists at the National Museum of Women in the Arts in Washington, D.C. and resides in many private collections around the world.

Falls by Joy Day

In an interesting departure from the usual rectangular shaped canvas, Joy shows us a lovely image of serene mountain side life somewhere in the universe.

Profile: Doug Caor I've been an artist for a while but in 1982 I made a "mid-course" correction and changed my my art work into the category of Astronomical Art. However, even as a child, I was infused with the theme of Space Exploration. My favorite toy was plastic clay, and with it came designs of hollow clay rockets holding clay astronauts. Since my father was an avid science fiction reader, he was probably responsible for sparking my first interest in space travel. During grade school, my penchant for balsa wood airplanes and and rockets became prominent. In junior high school, I machined aluminum parts and steel nozzles for a rocket which burned about 12 lbs. of solid fuel per second. This led directly to me making my own 8 inch reflector telescope and my love for astronomy.

That passion is still with me many years later. During my career as a geologist, I worked in the Department of Earth & Planetary Scientists at MIT. On many occasions, I found myself marveling over topographical maps of Mars and the various moons of our solar system. While examining the topo images, I realized I was probably experiencing the same feelings the first landscape painters and explorers had centuries ago. In that moment, my hobby of traditional style bronze casting swerved into the contemporary movement and Astronomical Art. About two years later, I finished my geology career and became a full time artist and sculptor.

In the 1980s I was inspired to cast bronze and aluminum planetary surfaces. They were topographically realistic, vertically enhanced, and portrayed various sections or Martian and Lunar highlands. In the 1990's, continued motivation in this theme brought enhancements with fiber optics, electroformed copper, and carbon fiber technology. Also during this period, I began painting my M-100 Spiral Galaxy in Virgo Series on contoured Mylar diffraction gratings. Just a few months ago, I discovered the beauty of stacking transparencies of M-100 in order to produce a 3-D sculpture.

From the perspective of medium, I always utilize high tech materials and techniques. Materials can also be a metaphor. For instance, my lunar surfaces were cast out of a home brew silicon - aluminum alloy. For me, this alloy represents the end product from a futuristic lunar processing facility which extracted oxygen and building materials from plagioclase regolith. I've enjoyed working with carbon fiber composites, lexan, titanium, and other materials. It is as if I am honing my skills in preparation for the day when I fabricate my own ship and go sailing in a warm, favorable stellar wind.



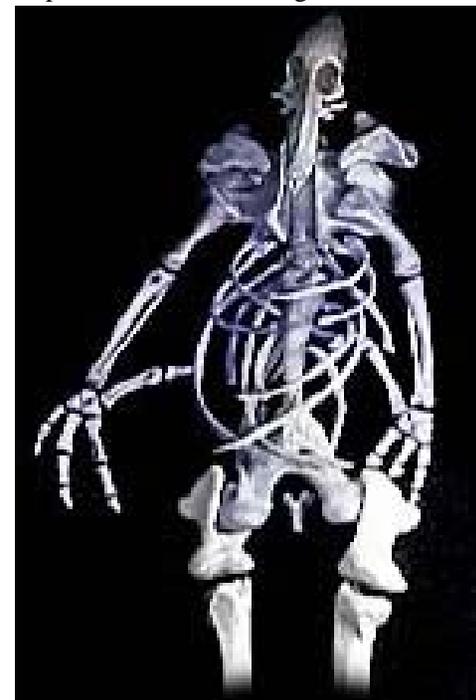
© Joy Day

Here's a little tip about brushes. A "fan brush" is a sable, bristle or white fake sable brush that has a flattened ferrel so all the bristles fan outward, like an oriental fan. It's terrific for blending and with enough medium (oil or water whichever you are using) it can blend gradations of color, and overall, with oils that remain wet, soften the colors by using a back and forth motion. It is also good to create the feeling of motion in a painting, especially for water/waves. And you can use an old beat up brush to create any number of variety of textures.

Now for a painting tip. Pick your favorite color and put a thin wash down all over the canvas in a middle value. After it appears to dry, take a rag or brush with only turpentine on it and "pull" out the highlights, then paint in the shadows with your darks. You should have a monochrome painting within a half-hour that you can apply thicker paint to. N.C. Wyeth and a lot of those old guys painted this way. Now it's not used as much because of acrylics. If you keep your color broken when you put down your thicker paint you'll see the whole canvas suffused with the color of the underpainting.

Exhibit B, Orthopterix qn. 2348j-56, Tau Ceti by Joel Hagen

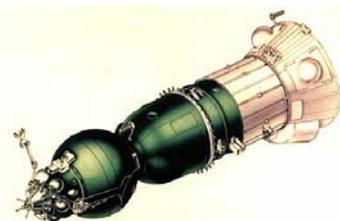
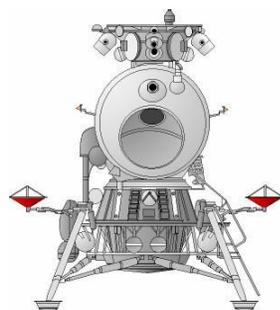
A skeletal exhibit from Joel's "Museum of Extraterrestrial Life" at his website, <http://www.ainet.com/hagen/>.



A Hardware Bonus...

For all you hardware buffs out there, he's a look at some hardware the Soviets actually built and tested for their failed Moon landing attempt. Can you identify them?

A:



:B

Kudos Korner

- Way to go to Don Dixon for the cover on the recent Sky and Telescope and to Pat Rawlings for an interior Pluto piece. Nice work guys!
- Kudos to BJ Johnson - BJ has the cover and a two page interior spread in the recent Scientific American Space Exploration Special
- The CA Academy of Sciences liked the "The Artist's Universe" show so much that they wanted to put up another exhibition of space art - the featured artist? Our very own Lynette Cook! Dates to be April 10 through September 6. She'll also have a solo show pretty much concurrently (June - Sept.) at Lick Observatory near San Jose. Double "yahoo!" to Lynette!
- I hope you checked out the ABC documentary "The Century" on the evening of March 29th. The soon-to-be-legendary Andy Chaikin was interviewed (again) during the portion that deals with Apollo. Andy was also on NPR (again!) Morning Edition on Apr 12 talking about the space shuttle program with Bob Edwards
- The Feb issue of Final Frontier featured an article on space art, specifically profiles of Bob Eggleton, Bill Hartmann, Mike Carroll, Joe Tucciarone & Pat Rawlings. Novagraphics agreed to give away a bunch of merchandise for a contest in exchange for the plug for our artists. TANSTAAFL - but still well done. (Special thanks to Kim Poor!)
- Another kudos to Pat Rawlings for his image in Sky and Telescope magazine
- Mike Carroll and Don Davis have been busy too. They've got a couple of great images in the recent Ad Astra
- And another feather to Mikey for his artwork on Discovery Channel's "Colonies in Space"
- Ron Miller and Bill Hartman are back in print, though separately this time. Ron has a new book out from Grolier, "The History of Rockets", intended for early teens. Bill has produced the fourth edition of his excellent textbook "Moons & Planets." You'd think these guys were teachers or something... ☺
- Our own prez Dave Hardy has some Kudos coming. Cover for "Know Your World Extra" in Weekly Reader and color background for an interview with George Abbey, Director Johnson Space Center in Feb./March "State of the Arts" (which Pat Rawlings is also featured in). And a very nice poster of the 99 August eclipse... he is also in Psychic, by Big Bang Posters in Scotland in which he is mentioned as Pres. of the IAAA and has our web site listed. Way to go Dave!!
- Sam Dietze had two pieces accepted into the "Spring Thaw" juried art show in March in Huntington, PA
- Kudos to Pat Rawlings for his two images in the Planetary Report, a very nice painting of the Mars sample return mission and his highly known piece of Valles Marinaris at sunrise

IS SOMEONE OUT THERE?

It is probably the single most important question humankind has ever conceived - "Are we alone in the universe?" The sociological, political, and religious ramifications of learning that intelligent life exists on a planet besides Earth are enormous. What will we do when we find it? (I don't think "if we find it" should even be considered.)

As important as the question of what we will do is, we should think about how likely finding extraterrestrial intelligence is. One man has done just that - Dr. Frank Drake, the President of the SETI Institute. While working as a radio astronomer at the National Radio Astronomy Observatory in Green Bank, West Virginia, Dr. Drake thought up a way to estimate the number of technological civilizations that might exist among the stars.

Dr. Drake conceived an approach to bound the terms involved in estimating the number of technological civilizations that may exist in our galaxy. "The Drake Equation", as it has come to be known, was first presented by Dr. Drake in 1961 and identifies specific factors thought to play a role in the development of such civilizations. Although there is no unique solution to this equation, it is a generally accepted tool used by the scientific community to examine these factors. The now famous equation is as follows:

$$N = R_* \cdot f_p \cdot n_e \cdot f_l \cdot f_i \cdot f_c \cdot L$$

N equals the number of "communicative civilizations," which is the number of civilizations in the Milky Way Galaxy whose radio emissions are detectable.

R_{*} equals the rate of formation of suitable stars, or more specifically, the rate of formation of stars with a large enough "habitable zone" and long enough lifetime to be suitable for the development of intelligent life.

f_p equals the fraction of those stars with planets. The fraction of Sun-like stars with planets is currently unknown, but evidence indicates that planetary systems may be common for stars like the Sun.

n_e equals the number of "earths" per planetary system. All stars have a habitable zone where a planet would be able to maintain a temperature that would allow liquid water. A planet in the habitable zone could have the basic conditions for life as we know it.

f_l equals the fraction of those planets where life develops. Although a planet orbits in the habitable zone of a suitable star, other factors are necessary for life to arise. Thus, only a fraction of suitable planets will actually develop life.

f_i equals the fraction of life sites where intelligence develops. Life on Earth began over 3.5 billion years ago. Intelligence took a long time to develop. On other life-bearing planets it may happen faster, it may take longer, or it may not develop at all.

f_c equals the fraction of planets where technology develops. This is the fraction of planets with intelligent life that develop technological civilizations, i.e., technology that releases detectable signs of their existence into space.

L equals the "Lifetime" of communicating civilizations or the length of time such civilizations release detectable signals into space.

Let's run an example of the equation. Let's set **R_{*}** at 100 billion, about the number of stars in the Milky Way Galaxy. With **f_p** we'll "generously" say 1 star in 10,000 forms planets, which considering the number of extra solar planets discovered in our neighborhood is probably way too high. Next, we'll say only 1 star in 1,000 with planets has planets in the habitable zone, hence **n_e** is .001. Now we'll say 1 planet in 1,000 in the habitable zone forms life, so **f_l** also = .001, although experiments with creating the basic building blocks of life suggest this could be much lower. We'll say that with enough time (like 4.5 billion years) life will always develop intelligence, therefore **f_i** is 1. Likewise, generously we'll assume that intelligence always leads to technology, **f_c** is also 1. Lastly, we'll use ourselves for the lifetime number. We've been broadcasting signals for 60 years and there are no indications we'll stop in the next 40 (but after that I won't speculate), so we'll set **L** at 100. What does the Drake equation say? Under this example, there are no less than **1,000** intelligent civilizations in our galaxy alone! Now multiply this by 100 trillion galaxies in the universe....

Within the limits of our existing technology, any practical search for distant intelligent life must

necessarily be a search for some manifestation of a distant technology. The majority of the scientific community has long considered a search for extraterrestrial radio signals the most promising approach. The Drake Equation is a simple, effective tool for making us realize how much we are a part of the universe around us.

Searching by Michael Böheme

A jellyfish-like creature floats above in the sky of a gas giant, contemplating the stars above.

