# SJAA EPHEMERIS


## SJAA Activities Calendar

Jim Van Nuland

***(late) April***

**25** Astronomy Class at Houge Park. 8:00 p.m. Topic: Beginner's Workshop. Bring your scope and we will help you use it.

**25** Houge Park star party. Sunset 7:52 p.m., 72% moon rises 1:08 a.m. Star party hours: 9:00 until midnight.

***May***

**3** Dark Sky weekend. Sunset 8:00 p.m., 2% moon rises 5:14 a.m. Henry Coe Park's "Astronomy" lot has been reserved.

**9** Houge Park star party. Sunset 8:05 p.m., 29% moon sets 1:06 a.m. Star party hours: 9:00 until midnight.

**17** **General Meeting at Houge Park**. 8 p.m. Our speaker is Dr. Dana Backman of the SETI Institute. His topic is "Nearby Stars and Debris Disks: A Ringside Seat to Planet Formation."

**30** Astronomy Class at Houge Park. 7:30 p.m. Paul Kohlmiller and Steve Nelson will present an Introduction to Astrophotography.

**30** Houge Park star party. Sunset 8:22 p.m., 16% moon rises 3:09 a.m. Star party hours: 9:30 until midnight.

**31** Dark Sky weekend. Sunset 8:22 p.m., 8% moon rises 3:43 a.m.

***June***

**7** Coyote Lake County Park public star party. Sunset 8:26 p.m., 25% moon sets 12:13 a.m.

**7** Dark Sky weekend. Sunset 8:26 p.m., 25% moon sets 12:13 a.m. Henry Coe Park's "Astronomy" lot has been reserved.

**13** Houge Park star party. Sunset 8:29 p.m., 84% moon sets 2:46 a.m. Star party hours: 9:30 until midnight.

**21** **General Meeting at Houge Park**. 8 p.m. Our speaker is Dr. Helen Quinn on the "Mystery of the Missing Antimatter."

**27** Houge Park star party. Sunset 8:32 p.m., 30% moon rises 1:39 a.m. Star party hours: 9:30 until midnight.

**28** Astronomy Class (beginner's workshop) at Coyote Lake County Park

**28** Coyote Lake County Park public star party. Sunset 8:32 p.m., 20% moon rises 2:14 a.m.

*The Board of Directors meets before each general meeting. Call the hotline for the exact time.*

*The Shallow Sky*

## A (Not So) Swiftly Tilting Planet

Akkana Peck

Saturn hangs in the western sky throughout the evening, setting a few hours after midnight. The rings are tilted almost ten degrees from edge-on; while that may not seem like much compared to what we've seen over the past several years, it's the biggest tilt we'll see all year. After this month, the rings will slowly close even farther, though we won't see them edge on until next year. The shadow of the planet on the rings should be easy to see, too, giving Saturn that amazing three-dimensional look.

Mercury is visible in the evening sky for the first three weeks of May. This is the best view we'll get this year. By the third week it's starting to wane and expand into a large, but slim, crescent, after which it will fade as the crescent becomes slimmer and slimmer and Mercury drops toward the sun. For binocular or rich-field scope observers, check out Mercury's pass just south of the Pleiades on the nights of May 1 and 2.

Mars has retreated (or, rather, Earth has raced ahead of Mars in our faster inner orbit) and now shows a small disk less than six arcseconds across, at roughly first magnitude. That's so small that it'll be hard to see much detail on the planet's face. But it'll make up for that with a lovely wide-field view on the night of May 22nd, when Mars will drift through the Beehive star cluster (M44 in Cancer).

The moon, too, flirts with the Beehive, passing through it on the night of the 10th. But the five-day-old moon may be too bright to make a good pairing with the fainter cluster. It's still worth a look! May's moon also makes close passes with two bright stars, Regulus (on the 12th during the day) and Antares (the night of the 20th). Both passes are occultations somewhere in the world, but, alas, not in San Jose.

Venus is visible in the morning sky, but it becomes harder to find as the month progresses and gibbous Venus retreats to the far side of the sun. With it are Jupiter, Uranus, Neptune and Pluto too, all ensconced in the morning sky and too near the Sun to be good observing targets this month.

**24 hour news and information hotline:**
**(408) 559-1221**
**http://www.sjaa.net**

# DEEP SKY OBSERVING

by Mark Wagner

May 2008 third quarter to new moon observing list. The list begins in the north and moves southward. Targets are rated 1 or 2 for challenge, with 1 being easier. All objects are within one hour of right ascension, north to south, in the east at astronomical dark. More objects are in the full list which is at http://www.resource-intl.com/Deep.Sky.May.08.html

| Rating | Object | Const. | Type | Size | Mag | R.A. | Dec. |
|---|---|---|---|---|---|---|---|
| 2 | NGC 5322 | Boo | GX | 5.9'x3.8' | 11.1B | 13 49 14 | 60 11 26 |
| | Small, bright, obvious, with apparently stellar center, dim extent beyond core. | | | | | | |
| 2 | N5585 | Uma | GX | 6.1'x3.8' | 11.2B | 14 19 47 | 56 43 45 |
| | Moderately bright, fairly large, elongated, brighter core. Member of the M101 group. | | | | | | |
| 2 | N5485 | Uma | GX | 2.4'x1.8' | 11.4V | 14 07 11 | 55 00 05 |
| | Wonderful field. NGC 5486 has NGC 5485 just to its south, significantly brighter, more obvious. | | | | | | |
| 1 | M101 | Uma | GX | 28.9'x26.9' | 8.3B | 14 03 12 | 54 20 55 |
| | Arp 26 fairly bright, very large, round bright core. Fairly low surface brightness, several distinct arms. | | | | | | |
| 2 | NGC 5474 | Uma | GX | 4.7'x4.7' | 11.3B | 14 05 01 | 53 39 38 |
| | Fairly bright, large, irregular,unusual appearance, brighter knot or core located at NE edge. | | | | | | |
| 2 | N5448 | Uma | GX | 4.0'x1.7' | 11.9B | 14 02 50 | 4910 25 |
| | A nice edge-on, roughly E/W. A stellar core seems to come and go, like the blinking PN | | | | | | |
| 2 | N5371 | Cvn | GX | 5.5'x4.0' | 10.5V | 13 55 39 | 40 27 42 |
| | Bright, fairly large, small bright nucleus, slightly elongatedN-S. | | | | | | |
| 2 | Arp 178 | Boo | GX | 2.4'x2.2' | 11.6V | 14 24 07 | 34 51 31 |
| | NGC 5614 fairly bright, moderately large, slightly elongated, prominent core. Pair with N5613. | | | | | | |
| 2 | NGC 5363 | Vir | GX | 4.0'x2.5' | 11.1B | 13 56 07 | 05 15 25 |
| | Looked pretty much face-on, with a very bright stellar core and a bright halo. 7 galaxies in group. | | | | | | |
| 2 | NGC 5364 | Vir | GX | 6.7'x5.4' | 11.2B | 13 56 12 | 05 00 55 |
| | Moderately bright, large, broad weak concentration, elongated. Forms pair with N5360 and N5363 6th of 7 in N5363 group. | | | | | | |
| 2 | NGC 5566 | Vir | GX | 6.7'x2.1' | 11.5B | 14 20 20 | 03 56 01 |
| | Arp 286 bright, fairly small, slightly elongated, small bright nucleus. Brightest of three with N5560 and N5569. | | | | | | |
| 2 | NGC 5576 | Vir | GX | 3.9'x2.6' | 11.0V | 14 21 03 | 03 16 16 |
| | NGC 5660, 5676, 5673 (Bootes), galaxy group, face-on and eliptical galaxies within one view. | | | | | | |
| 2 | N5638 | Vir | GX | 2.7'x2.4' | 11.2V | 14 29 40 | 03 14 00 |
| | Pretty small, dim, round, maybe slightly brighter center | | | | | | |
| 2 | NGC 5746 | Vir | GX | 7.5'x1.3' | 11.3B | 14 44 56 | 01 57 14 |
| | Fairly faint, moderately large oval, broadly concentrated with no core. | | | | | | |
| 1 | NGC 5634 | Vir | GC | 5.5' | 9.5 | 14 29 37 | -05 58 35 |
| | 210x showed ragged edge, bright core, didn't resolve, so it really did look like a galaxy. | | | | | | |
| 1 | NGC 5694 | Cen | GC | 4.3' | 10.2 | 14 39 36 | -26 32 18 |
| | Moderately bright, but compact globular of 2'diameter with a round, symmetrical appearance. | | | | | | |

Note: Source catalogs are Messier, Arp, Abell Planetary, Abell Galaxy Cluster (AGC), Hickson Compact Galaxy (HCG), Sharpless HII Regions, Barnard Dark Nebulae, Herschel 400-I, Herschel 400-II. Herschel 400-I are identified as NGCXXXX, Herschel 400-II as NXXXX.

# Get Out of Town!

Rob Hawley

Last month I talked about the two Galaxy Seasons in my Beginner's Corner. It leaves open the question of where to go to see galaxies. Light Pollution as well as our local nighttime humidity (and fog) are the enemies of being able to enjoy our galactic neighbors.

**Local Sites**

Galaxies are dim. You can "see" M31 from Houge Park and most of the Messier Galaxies on a good night in Almaden Valley. "See" here really means detect. Several local sites offer a better chance to observe detail in the Messier and most of the TAC Eye Candy[1] Objects. In my mind, the best sites within about an hour of San Jose are (in my own preference order) Dinosaur Point, Fremont Peak, Henry Coe State Park, and Coyote County Park. Check the TAC website for details on the access rules[2] and when other observers are going[3]. Dinosaur Point is only open on certain nights and only during the winter months.

**Travelling Further in California**

Unfortunately, each of the previous sites is not really that dark (unless you get lucky with the fog). As you move to dimmer objects or desire to see more detail in the brighter ones you will have to travel. California still has some sites that are relatively dark. I will talk about these in order of their distance from San Jose.

- Lake San Antonio – Located about 3 hours south of San Jose where the club and GSSP hold our fall CalStar. It is the closest truly dark area on publicly accessible land. The area used for CalStar is open year round. Check the club website[4] and be sure to call the rangers before going[5].

- Private Land – Some private landowners permit other astronomers to share their land. Two of these sites are occasionally announced on the TAC mail list[6].

- Sierras/Lassen – The Sacramento branch of TAC uses several sites in the mountains. I have personally never participated, but sites look good. The TAC sites page discusses several sites, but announcements may only be made on TAC-SAC[7]. GSSP held their event last year at Lassen.

- Golden State Star Party – The last (and probably darkest) is the Golden State Star Party[8] located in northeastern CA. The summer time is not ideal for galaxy hunting, but the spring objects are still up at sunset and the fall objects are rising at sunrise.

**Out of California**

If you are willing to travel even further then you can find some of the darkest skies. Different latitudes also offer the advantage of being able to view different objects.

- Other Star Parties – Other major star parties are held each year in Oregon[9], Texas[10], Washington[11], and Arizona[12,13]. A more complete list is published in Sky and Telescope.

- Sunglow Ranch, Arizona[14] – Located about 2 hours east of Tucson offers the ideal combination of dark skies, dry air, and attitude. As a bonus at the end of the night you can sleep in a hotel room a few steps from your scope and eat gourmet meals. BYOT[15].

- New Mexico Skies[16] and Star Hill Inn[17], New Mexico – Both of these sites offer on-site telescope rental. I have never been to these sites.

- TravelQuest Trip to Costa Rica[18] - My favorite travel agent arranges an annual trip to a site on the west coast of Costa Rica in February. During that time the Costa Rica weather is much like California's summer weather. Its more southerly location allows viewing of the southern Milky Way. In addition. several galaxy groups that are too far south for California are visible. BYOT.

- Southern Hemisphere Locations – I have done a fair amount of travelling on my own and with groups south of the equator. Several organized trips offer limited observing possibilities[19].

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*Get Out of Town!*
*Continued from 3*

You have more options if you are willing to be your own travel agent. Australia offers the language advantage plus a western society, but at the cost of driving on the left side. The Magellan Observatory[20] near Sydney offers scope rental like the New Mexico sites. For other sites you will have to make all of the arrangements and will be strictly BYOT. Chile is also a possibility. I will likely go there in 2010, although mostly for other reasons. Others have done trips on their own to the desert. Africa has dark skies, but presents serious security and safety challenges.

**Summary**

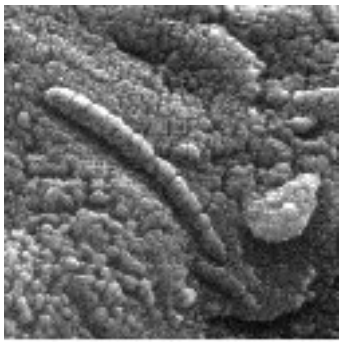
Unfortunately if you want to see objects beyond the urban star party objects you will have to travel a few hours or half way around the world. Doing so will open up new observing possibilities for you to explore.

1. http://observers.org/observing/eyecandy/index.html
2. http://observers.org/sites/
3. http://observers.org/OI-calendar/
4. http://www-space.arc.nasa.gov/~astrochm/Lake%20San%20Antonio/Lake_San_Antonio.html
5. LSA Park Office 805 472 2311
6. http://observers.org/TAC.cgi/Mail_List.32posts/
7. http://tech.groups.yahoo.com/group/tac-sac/
8. http://www.goldenstatestarparty.org/
9. http://www.oregonstarparty.org/
10. http://www.texasstarparty.org/
11. http://www.tmspa.com/
12. http://www.eastvalleyastronomy.org/aasp.htm
13. http://www.tucsonastronomy.org/gcsp.html
14. http://www.sunglowranch.com/
15. Bring Your Own Telescope
16. http://www.nmskies.com/webpage/
17. http://www.starhillinn.com/StarHillInn.html
18. http://www.tq-international.com/CostaRica2009/CRhome.htm
19. http://www.melitatrips.com/easterisland/index.html
20. http://home.goulburn.net.au/~magellan/

# The Curious Case of ALH84001

Paul Kohlmiller

About 4 billion years ago, a meteorite slammed into Mars. The location where it hit contained some carbonates and some iron. The pressure of the impact pushed the shocked Martian soil well below the surface. There it was under pressure and cooled only slowly. Then a few million years ago, another impact event on Mars liberated a rock containing this material and gave it a speed greater than the Martian escape velocity.



*Could this be a fossil left oby Martian bacteria? Photo from NASA.*

This rock traveled the solar system between Earth and Mars until about 17,000 years ago. It then entered the Earth's atmosphere and landed in an area of Antartica that we now call Allan Hills. Only recently have humans deliberately scoured Antartica looking for meteorites and this rock was found in 1984 and given the name ALH84001. Meteorites are fun but not all that special and that was the fate of ALH84001 until someone decided to compare the gases trapped inside of it to the Martian gases as measured by the 1976 Viking landers. Suddenly, the dull rock ALH84001 was a rock star (pun intended). This happened in the early 1990's and in 1996, a famous paper by Dave McKay et. al. claimed that ALH84001 showed possible signs of biological activity. What followed was a debate between the biotic proponents and the abiotic proponents. The debate continues. Here are some highlights.

As soon as it was determined that ALH84001 came from Mars, the odd shapes on the meteorite started to look suspicious. Some of the shapes looked like bacteria. Could these be fossils of bacteria? Several alternative explanations were advanced.

- The bacteria are nothing but terrestrial contamination.
- The procedures for preparing samples for an electron microscope scan might have created these kinds of structures.
- The structures seem to be too small to be from bacteria.
- Pictures taken with an electron microscope show apparent structure that isn't really functional.
- Many abiotic mechanisms could create similar structures.

Although all of these explanations were refuted by the biotic proponents, it became clear that arguing based on shapes was not convincing.

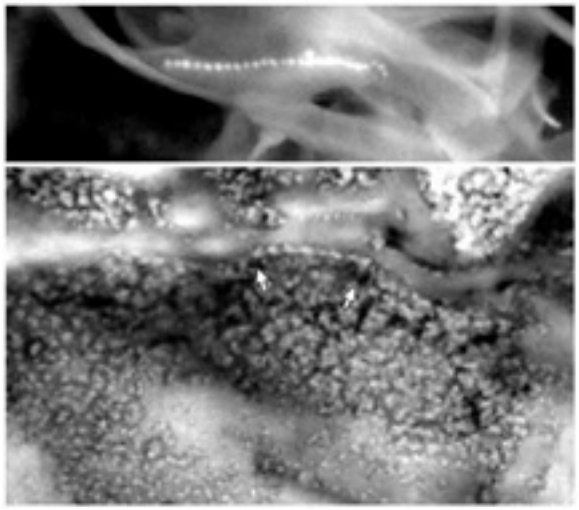
PAH stands for Polycyclic Aromatic Hydrocarbons. An example of a PAH is Napthalene, C10H8. This is the substance that gives mothballs their particular odor (they aren't called "aromatic" for nothing). These chemicals can be either complex or simple. PAHs tend to be created by biological processes on Earth but it is not the only way that they can be created. However, without some kind of process generating PAHs, they will eventually break down into simpler substances (mothballs don't last forever).

Some abiotic proponents say that the PAHs are the result of terrestrial contamination but that has been shown to be unlikely. The PAHs found in ALH84001 are mostly of the simple variety while Earth-bound PAHs tend to the more complex. Also, more PAHs were found in the inner sections of the meteorite than on the outside.

The magnetite found in ALH84001 was found to have characteristics that are only found in magnetotactic bacteria – a kind of bacteria that produces magnetite. This bacteria was only discovered on Earth in 1975. But magnetite can be made in both biotic and abiotic processes. It was demonstrated by the abiotic group that magnetite can be formed by shocking another mineral, siderite. The characteristics of the magnetite found in ALH84001 that are not compatible with nonbiological magnetite are:

- Uniform crystal size,
- Gaps between crystals,
- Orientation of elongated crystals and
- Flexibility of magnetite chains,

This continues to be the strongest point for the biotic proponents. All abiotic attempts to create magnitite do not create the types of magnitite created biologically. The debate remains open with both sides hoping that further Martian exploration, hopefully to someday include sample returns, will declare the victor. In the meantime, it is interesting how the more we search for life on Earth the more places we find it, but the more we look for life on Mars, the more alternative explanations come forth. And that's how it should be.



*Above is a picture of a chain of magnitite inside of a magnetotactic bacterium. Below, a chain of magnitite from ALH84001. Photo from NASA.*

# Cataloging What's In the Sky (Part 1)

Rob Hawley

Each year at Christmas and Valentine's Day the airways are filled with advertisements to "name stars". The various companies in this business vary in the degree that they are candid about what they are selling. The best admit that whatever they produce is "For Entertainment Only"[1]. Others operate closer to P.T. Barnum and his "This Way to the Egress"[2] which was accurate, but intentionally misleading. That leads to the larger question of how is stuff really named. I will explore that question over the next few columns.

The simple answer is that for objects outside of the solar system nothing is named (or at least new names are not being added). Instead as technology has improved a number of people have cataloged objects in the skies with different degrees of precision. Each of these efforts has produced its own catalog. These catalogs in some cases overlay existing work. In others, they catalog known objects with interesting behavior. Finally, they may catalog new objects that were beyond the ability of previous technology to record.

In this Ephemeris we will take a look at the evolution of cataloging deep sky objects. Deep Sky Objects are everything except individual stars.

**Catalogs and Lists**

For the purpose of this series I will define two terms; catalog and list. A "catalog" is a primary reference giving the location and description of an object as produced by some form of formal survey. We will mention several in this paper and subsequent papers.

I will be using the term "list" to refer to a secondary compilation of objects. A list refers to object as entries in one or more catalogs rather than trying to act as a definitive reference.

**In the Beginning**

Man has been looking at the skies for thousands of years. Early civilizations recognized that the sky contained important clues that it was in the best interest of society to understand. After all, the rising of the sun gave clues to when to plant, when winter began, etc. Shamans in early societies taught themselves the sky, which allowed them to predict astronomical events[3]. They soon noticed the wandering stars and added the 5 visible planets to their developing religions[4]. Seafarers learned to use the stars to navigate and gave them names[5].

About 3000 stars are visible in the darkest skies[6]. Only a handful of deep sky objects can be seen unaided. Among them Andromeda, several open clusters (Hyades, Pleiades, Double Cluster, Praesepe), and M42. The introduction of the telescope in the 1600s allowed observers to see many more objects.

**The Messier List**

By the late 1700s telescopes had improved to about the level of today's beginner scopes. The French Comet hunter Charles Messier began systematically recording the locations and descriptions of a number of objects. References state that he did this so he would not confuse them with the comets he was hunting[7]. From 1758 until 1781 he created and then published his first list of 103 objects[8]. In subsequent years he refined his list and added several more bringing his total to 110 (or 109).

The Messier List remains the best "Best of…" list in the sky.

**The Herschels**

Across the channel William Hershel was also cataloging. Hershel became the Royal Astronomer in 1781 following his discovery of Uranus[9]. That gave him the resources to begin a systematic cataloging of the many objects visible in late 18th Century telescopes. He published his first catalog of about 1000 objects in 1786[8]. By 1802 he had cataloged almost 2500 objects. His son John carried the effort to the southern hemisphere setting up in South Africa in 1834 and adding the southern objects to the rapidly growing number of catalogd objects. John eventually produced the General Catalog in 1864[10].

The Herschel family was not alone. Others were busy at work doing their own cataloging[11]. These other catalogs varied greatly in quality leading to much confusion and overlap[12] .

**The New General Catalog (NGC) and Index Catalog**

By the late 1800's so many different catalogs existed that it was time to integrate them into a single list. J. L. E. Dreyer attempted to resolve the conflicting discovery claims, descriptions, and positions. He published a revised New General Catalog in 1888[10].

Once again the increasing ability of instruments demonstrated the NGC was not complete. Dreyer subsequently published the Index Catalog as two supplements (1895 and 1908[13] ) to the NGC bring the total number of cataloged objects to about 13,000[14].

More importantly for amateurs the combined NGC/IC represents virtually all non-stellar observable objects.

**The Modern NGC/IC Project**

Unfortunately even after the great work of Dreyer the NGC was still imperfect. Starting in the 1990's a group of professionals and amateurs set out to review all of the original material, correct the positions, and resolve the discrepancies. Steve Gottlieb spoke to SJAA in 2005 as the project neared its completion. Most of the NGC/ IC objects are within the abilities of a skilled amateur observer with a modern telescope. Volunteers like Steve have re-observed all of the NGC and IC to add contemporary descriptions and correlate the original observations to modern Sky Survey images[15].

**Summary of Part I**

The NGC / IC catalogs virtually all of the objects of interest to an Amateur. The original Messier list was subsumed by the Herschels' and Dreyer's work and should now be considered a list of interesting NGC objects. Others have made lists of their favorite objects. We will talk about some of these lists in future months.


1. For Example StarNamer.com states (in very small letters) "Our star naming is not recognized by the scientific community. Your star's name is reserved in Starnamer records only"

2. http://www.ptbarnum.org/egress.html

3. "How the Shaman Stole the Moon ", William Clark, http://williamcalvin.com/bk6/index.htm

4. http://en.wikipedia.org/wiki/Planet

5. http://www.naic.edu/~gibson/starnames/

6. http://answers.google.com/answers/threadview?id=742414

7. http://seds.org/MESSIER/xtra/history/CMessier.html

8. http://seds.org/MESSIER/xtra/history/timeline.html

9. http://micro.magnet.fsu.edu/optics/timeline/people/herschel.html

10. http://www.ngcic.org/history.htm

11. http://seds.org/Messier/xtra/similar/catalogs.html

12. Steve Gottlieb in his NGC/IC presentation to SJAA

13. http://seds.org/~spider/ngc/ngc.html

14. http://seds.org/~spider/spider/ScholarX/hist_mod.html

15. http://www.ngcic.org/pubdb.htm

# Tracking Wildlife from Space

Patrick L. Barry

It's 10 o'clock, and do you know where your Oriental Honey Buzzard is?

Tracking the whereabouts of birds and other migrating wildlife across thousands of miles of land, air, and sea is no easy feat. Yet to protect the habitats of endangered species, scientists need to know where these roving animals go during their seasonal travels.

Rather than chasing these animals around the globe, a growing number of scientists are leveraging the bird's-eye view of orbiting satellites to easily monitor animals' movements anywhere in the world.

The system piggybacks on weather satellites called Polar Operational Environmental Satellites, which are operated by the National Oceanic and Atmospheric Administration (NOAA), as well as a European satellite called MetOp. Sensors aboard these satellites pick up signals beamed from portable transmitters on the Earth's surface, 850 kilometers below. NOAA began the project—called Argos—in cooperation with NASA and the French space agency (CNES) in 1974. At that time, scientists placed these transmitters primarily on buoys and balloons to study the oceans and atmosphere. As electronics shrank and new satellites' sensors became more sensitive, the transmitters became small and light enough by the 1990s that scientists could mount them safely on animals. Yes, even on birds like the Oriental Honey Buzzard.


*The ARGOS program tracks the whereabouts of endangered migrating animals via miniature transmitters on the animals and the POES satellites in orbit.*

"Scientists just never had the capability of doing this before," says Christopher O'Connors, Program Manager for Argos at NOAA.

Today, transmitters weigh as little as 1/20th of a pound and require a fraction of a watt of power. The satellites can detect these feeble signals in part because the transmitters broadcast at frequencies between 401 and 403 MHz, a part of the spectrum reserved for environmental uses. That way there's very little interference from other sources of radio noise.

"Argos is being used more and more for animal tracking," O'Connors says. More than 17,000 transmitters are currently being tracked by Argos, and almost 4,000 of them are on wildlife. "The animal research has been the most interesting area in terms of innovative science."

For example, researchers in Japan used Argos to track endangered Grey-faced Buzzards and Oriental Honey Buzzards for thousands of kilometers along the birds' migrations through Japan and Southeast Asia. Scientists have also mapped the movements of loggerhead sea turtles off the west coast of Africa. Other studies

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*NASA Space Place*
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have documented migrations of wood storks, Malaysian elephants, porcupine caribou, right whales, and walruses, to name a few.

Argos data is available online at www.argos-system.org, so every evening, scientists can check the whereabouts of all their herds, schools, and flocks. Kids can learn about some of these endangered species and play a memory game with them at http://spaceplace.nasa.gov/en/kids/poes_tracking.

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

## Get Your Gummy Greenhouse Gases!

Nancy Leon

Making science edible--and sweet--is a reliable way to attracts kids' interest. The new "Gummy Greenhouse Gases" activity on The Space Place web site makes it fun and easy to learn a bit of chemistry and to find out why too many of these kinds of molecules in the air are likely to cause Earth to get warmer. At http://spaceplace.nasa.gov/en/kids/tes/gumdrops, kids use gumdrops and toothpicks to make simple molecules of ozone, nitrous oxide, carbon dioxide, water vapor, and methane. The curious can go on to http://spaceplace.nasa.gov/en/kids/tes/gases to learn more about the greenhouse effect and about the "good and bad" roles of ozone. A short video shows how new space technology can literally paint a 3-D picture of these gases all around the globe. Afterwards, the ghastly gases can be consumed (mind the toothpicks!), thus helping the environment.

## AbSciCon 2008

Paul Kohlmiller

On April 15th-17th, the SETI Institute sponsored the 5th conference on Astrobiology, called AbSciCon (Astrobiology, Science, Conference). It was held at the Santa Clara Convention Center. There were 600 conferees from 28 countries. The simple fact that there is such a convention with so many people and hundreds of presentations is remarkable. This is an area of science that was unheard of a generation ago, was effectively banned in the early 90's, then gained a lot of attention in the later 90's. The first such conference was in 2000.

The conference was set up to have a morning and an afternoon plenary session and then most of the rest of the time was spent in topical sessions. As many as 9 sessions were proceeding at the same time and the talks were 15-30 minutes long including questions. Beyond these talks there were also poster displays split up along the same lines as the topical sessions. Then add to all of that some other talks and "birds of a feather" sessions and it was a very full 3 days.

Simultaneously, the convention center was also hosting a MySQL conference. I was so chagrined to know that there were two very nerdy conferences going on simultaneously and I could have gone to either one.

Most of the talks were readily accessible. For example, Chris McKay gave a short talk that argued the proposition that an outpost on the moon makes sense because we need the practice before going on to Mars. His model is McMurdo station in Antartica.

A number of talks were either directly or indirectly related to ALH84001, the Martian meteorite that may or may not demonstrate that Mars had life. See page 5 for an update.

It was interesting to see so many tags with the same names as the authors of articles that I've referenced in my own articles. SJAA members will recognize many of these names: Seth Shostak, Jill Tartar, Chris McKay, Scott Sandford, Andrew Fraknoi just to mention some local notables.

At conferences like these I often take note of the diversity of the population. Sadly, it wasn't very diverse. The male/female ratio was actually very good for a scientific conference but racial diversity was missing. One of the poster presentations addressed this problem directly.

There were very few times where I felt I was just so out of touch that I could not understand the subject matter. But then I skipped some of the talks that struck me as the most arcane: "A Monoclonal Antibody Approach to Detecting Lipid Biomarkers and Assessing Their Syngeneity", "Near Infrared Spectroscopy of the Nitrogenated Polycyclic Aromatic Hydrocarbon Cations from 0.7 to 2.5 microns." Some of the least scary titles were: "The Atacama Desert as a Mars Analog", "Habitable Zone Limits for Dry Planets", "'Who's Looking at you Kid?': SETI Advantages near the Ecliptic Plane", "Astrobiology from Europan (sic) Orbit", "Biomedical Effects of Lunar Dust."

Here are some of the highlights as I saw them:

1. Charley Lineweaver's severe dismissal of the idea that evolution converges at intelligence.

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2. Terrence Deacon described how something like the Babelfish all-language translater from "The Hitchiker's Guide to the Galaxy" might actually be attainable.

3. Steve Kilston making the case that SETI should look for intelligences in the ecliptic plane because that's where there are stars that might already know about us (assuming they can detect us via solar transits).

4. A statistical evaluation of the Drake equation that demonstrated that the "average" distance to the closest ETI is 2670 light years +- 1309 ly.

5. The case was made for considering M stars as habitable planets. Within 10 pc there are 4 A and F stars; 54 G and K stars but 227 M stars. Also, M stars with planets tend not to have hot Jupiters which might be bad for life.

6. Expect to hear of planets around Alpha Centauri B by 2011. A new search will be made of that star which has many ideal features: 91% solar mass, habitable zone is close to the star, quiet in the X-ray part of the spectrum, metal rich, and the companion A is at least 30 AU away.

7. Just as today we detect hot Jupiters based on how they perturb their star, so future detections may find Earth-like planets that perturb their hot Jupiters.

8. David McKay reiterated that abiotic processes cannot account for the kind of magnetite found in Martian meteorite ALH84001. Another talk specified that abiotic processes can't produce the shape of the magnetite found on that rock.

9. In a tribute to Leslie Orgel (he died last October), Jerry Joyce discussed The RNA World. This body of work has progressed to the point where it can be shown that abiotic processes can possibly lead to replication. It is becoming more generally accepted that life started as RNA before evolving to DNA. Joyce also said that he believed that life would be created in a test tube before it is discovered on another world. An interesting bet.

10. Another tribute, this time for Stanley Miller, recalled the Urey-Miller experiment which created organics from a primordial soup that was electrified. This experiment was done in 1953, the same year that Watson and Crick published their findings on the double helix nature of DNA. It was also the year that a protein was first sequenced.

The conference was very well run for the most part. The supplied box lunches were awful and there was some confusion about which talks were held where and at least one meeting room was way too small. But I had a good time, learned a lot, and wouldn't mind going again some time.

## The Last 31 days in Astronomy

MAR-14-2008 ***Amino Acids on the Rocks*** A study has found that meteorites are a rich source of amino acids. In particular, the oldest meteorites have the most amino acids further suggesting that amino acids were far more present in the past. http://www.astronomy.com/asy/default.aspx?c=a&id=6732

MAR-18-2008 ***Water and protoplanets*** Two extrasolar protoplanetary disks have been discovered to have large amounts of water vapor. The detections were first made with the Spitzer infrared space telescope. Later more detailed measurements were made using a special infrared spectrometer on the Keck II telescope. http://www.astronomy.com/asy/default.aspx?c=a&id=6740

MAR-20-2008 ***Titanic Ocean*** Add Titan to the list of moons that contain an underground ocean. Recent radar measurements by Cassini shows evidence that such an ocean exists and it consists of water and ammonia. http://jpl.nasa.gov/news/news.cfm?release=2008-048

MAR-26-2008 ***Organics with Enceladus*** Remember that close flyby of Enceladus that Cassini did in early March? Turns out that it detected a surprising amount of organic material. The result is the Enceladus "tastes" like a comet but it has an internal source of heat. http://jpl.nasa.gov/news/news.cfm?release=2008-050

MAR-26-2008 ***STS-123 Lands*** The flight of STS-123 represented a milestone of sorts. It was the first time that all partners in the ISS were involved. The successful return of Endeavour means that the backup shuttle for the Hubble fixup mission will be ready in time. http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts123/mission_overview.html

APR-10-2008 ***Phoenix On Course*** The Phoenix Mars Lander spacecraft performed a minor course correction in anticipation of the May 25 landing. The current expected landing site is called "Green Valley". Another correction is possible based on additional images taken by the Mars Reconnaissance Orbiter. http://jpl.nasa.gov/news/news.cfm?release=2008-059

## Telescope Loaner Program

The loaner program offers members a means to try scopes of various sizes and technologies before you buy. It is one of the real jewels of being a member of the club. Scopes are available for all experience levels.

The inventory is constantly changing. As of this writing (early April) these scopes were available.

These scopes are currently available for loan.

| Scope Number | Scope Description |
|---|---|
| 43 | 4.5" f/8 Orion XT Dob |
| 32 | 5.5" f/7.6 Signature Dob |
| 23 | 6" f/8 Edmund Newt on EQ Mount |
| 11 | 6" f/8 Orion XT Dob |
| 34 | 8" f/10 Dynamax S/C |
| 29 | 8" Celestron S/C Astrophoto |
| 33 | 10" f/4.5 Orion DSE Dob |
| 45 | 10" f/5 Dob, Earletron |
| 7 | 12.5" f/7 Homemade Dob |
| But several scopes will become available in May | |
| 40 | 8" Celestron Super C8+ S/C |
| 6 | 8" f/10 Celestron S/C |
| 36 | 8" f/6 Celestron Skyhopper Dob |
| 46 | Orion XT6 IntelliScope with Object Locator |
| 48 | C-8 Celestron Ultima |

For up to date information please see the loaner program web page: http://www.sjaa.net/loaners




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