SIRIUS ASTRONOMER

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The above images of Mars show the results of many hours of hard work of just some of the many OCA Members who have been honing their skills as Mars nears the closet approach to the Earth in the past 60,000 years on August 27th. Of particular note is the image by Marc Huber (top left) showing the two moons of Mars (Deimos and Phobos) which he took through his 8" Meade LX10. For comparison next to it is a simulated representation of the exact same time produced by a feature available on the JPL web site. Brian Norman gets a "special award" as so far he must be the youngest OCA Member to produce an image of Mars (he is 14 years old). Note the image of Mars by John Sanford is a drawing he produced from a video image projected onto a monitor. See more Mars images at the OCA's on-line Image Album on our web site at www.OCAstronomers.org/astroimages/album.asp

OCA CLUB MEETING

The free and open club meeting will be held Friday, September 12th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. The featured speaker this month is OCA VP Joel Harris and the title of his talk is "Chasing the [Diminutive] Shadow: The Venusian Transit of June 2004"

STAR PARTIES

The Anza star party is on September 27th. The Black Star Canyon site will be open this month on September 20th. Members are encouraged to check the website calendar, for the latest updates on star parties and other events.

special note: *The Explore-the-Stars public star party and outreach will be held at the Observatory Campground on Palomar Mountain on Sep 20th. A special tour of the Palomar observatory is arranged just for ETS volunteers. If you would like to be a volunteer at ETS in September please contact Richard Cranston (email on the back of the newsletter).*

COMING UP

The beginners class will be held on Friday September 5th, at the Centennial Heritage Museum (formerly the Discovery Museum of Orange County) at 3101 West Harvard Street in Santa Ana.

Astrophysics SIG: Sep 19th.
Astro-Imagers' SIG: Sep 16th.
The EOA SIG: Sep 17th.

Please check the website calendar for the outreach events this month! Volunteers are always welcome!

President's Message

By Barbara Toy

As I write this, Mars is a blazing glory in the night sky, and is still getting larger in the eyepiece night by night. By the time you read it, we'll be past opposition and Mars will be receding – another indicator of the passage of time on the cosmic clock. Largely through the kindness of others, who've generously shared their telescopes, I've seen some great views as we approach, and hope all of you have, too. And, as a visit to the Mars section of the Member Image Album on the club website shows, many of our members have been getting great images using different types of equipment and have kindly posted them so we can all enjoy them.

Many of our members have been getting great images (of Mars)

Well, now we're heading into autumn. Schools are back in session, people are back from vacation, and the annual cycle continues. The cycle of club events also continues, with the next Board meeting on September 14, the club banquet on October 12, and the beginning of our own election season, with nominations for the trustee and officer positions in November and December, and the election itself in January. So, if any of you were too late to declare your candidacy for governor – here's your chance to run for elective office!

More Changes at OCA...

We have been very fortunate in having Liam Kennedy's many contributions to the club. He's been our webmaster now for several years, and continues to come up with ways to improve the website. He made the Anza weather station functional and continues to keep it going. He was instrumental in getting broadband service to our Anza site and continues to work with the provider to improve the service. He found the new printer for the Sirius Astronomer and negotiated the contract we have with them, and he has remained intimately involved with the newsletter, most recently stepping in as the interim editor when Darren Thibodeau had to relinquish the position. He has expanded on the past videotaping of the club meetings with his newest venture, the new OCA television program that is currently broadcast on Cox in southern Orange County. He continues to be active in the Outreach program, and does regular educational presentations for the Upper Newport Bay outreaches as well as Explore the Stars and other venues. And, of course, he's been very active as a Board member since stepping down from the presidency last January.

This is just a partial list of what Liam's been doing for the club, and it's not too surprising that, as he has been getting busier with his new company, he's found that he no longer has enough time to do it all. After a lot of consideration, he has decided that the best resolution for him is to give up his Board position, and so he is resigning as trustee. We are very sorry to lose him as a regular member of the Board. Even though we know that he will always be available if we need information or input, and that he will continue in his many other roles, it is unquestionably a sad loss for us.

On behalf of the Board and the club as a whole, I want to thank Liam for all of his hard work during his years as a Board member, and as president and vice president of the club in past years, and also to thank him for his continuing efforts in his many other club-related activities.

Sirius Astronomer

On the brighter side, Steven Condrey is working with Liam on producing the September SA so he can see what goes into it, and, if all goes well, we hope that he will be stepping in as the new editor of the SA with the October issue. Steve has done copy editing and reporting for his college newspaper as well as for the San Diego Criminal Defense Bar Association newsletter and an on-line newsletter for his Union Chapter. We are delighted that he has volunteered to help us out with the SA, and profoundly hope that everything goes well and that he becomes our new editor.

The OCA Banquet is on! Sunday, October 12 at 6:00pm

I am also happy to report that we had some other people express interest in helping out with the SA. There is certainly a lot that could be done, and, as I said last month, I am hoping that we can get an ongoing group of interested volunteers who can help with, in particular, the most time-consuming (but also the most interesting) part of putting the paper together – developing the articles that go in it each month. If you are interested in helping out, please contact Liam (Liam.Kennedy@ocastronomers.org) or me (btoy@cox.net).

The OCA Banquet

The OCA banquet is on! The date: Sunday, October 12, at 6:00 p.m. The place: the Orange County Mining Co. in Orange. More good news: Joel has found us a truly excellent speaker, Stephen Edberg of JPL. We also expect a very special Mystery Guest, one you won't want to miss!

The Orange County Mining Co. has a lot of advantages – it's convenient for most members, has a nice view of the county from its hillside location, has ample parking, provides good and plentiful food – all good reasons why it proved a better location than the others we considered. We've always had a good time there in past years, and expect this year's banquet to be even better!

Among other things, the banquet is a time to meet and visit with the Significant Others of people you know from star parties and other club events, and a time to show people close to you who may not generally attend club functions what great people you hang out with in the club. It's also a time to catch up with old friends, meet new people, share some memories, enjoy good conversation, and generally have a great time. Many thanks to Joel Harris, who spent a lot of time and did a lot of work investigating alternatives, working with the caterer, and arranging the entertainment.

The cost is only $45.00 per person. Tickets will be available at the September meeting, or contact Charlie Oostdyk or me about buying them.

Why Be an OCA Member?

A couple of months ago, a gentleman came up to me at the general meeting and wanted me to tell him why he should join the club. My answer at the time focused on the wide array of activities and benefits that the OCA offers its members. Top of the list for active observers and photographers, of course, are access to our Anza dark sky site and the local Black Star Canyon star parties. The Sirius Astronomer gives a wide range of information to local amateur astronomers, including the chance to identify other people who share the same interests. Members can take advantage of discounts on subscriptions to the major astronomy magazines. Special interest groups provide ready-made "communities" of people exploring special topics or activities.

As I was thinking about the subject later, I realized that there can be a big difference between what causes someone to join the club and what keeps that person in the club over time. Because OCA covers the whole gamut of amateur astronomers' interests, and also has the flexibility to take in new activities as groups of members develop new interests, what a particular member values in the club can change significantly over time. In other words, your original reasons for joining may not be the most important part of your membership a year or two later. And being a member can expand your horizons in ways you never would have guessed at the time you joined…

If I might illustrate using the case I know best (my own), I originally joined because I enjoyed the general meetings and liked the people I talked to at the meetings. For the first few months, I was pretty oblivious to the other club benefits, even though I heard the announcements and even though I hadn't had much luck finding good places for observing on my own.

The turning point for me was volunteering for the Outreach program several months after I joined the club. The first outreach I went on was in the parking lot of the Discovery Center on a night that was too overcast to see more than a star or two overhead, and, to make it worse, all the lights in the parking lot were left on, as well. The few telescopes we set up ended up focused on surrounding office buildings, but, when the kids (and their parents) who were attending the astronomy program inside came out, they seemed pretty excited to be looking through telescopes at all. While all of us volunteers waited for the program inside to end, we talked about all kinds of things and had a great time – and, by the end of the evening, I was thoroughly hooked as an outreacher. Showing how one thing can lead unexpectedly to another, when election season came up near the end of that year, Jim Benet, through persistence, convinced me to run for the Board, which is about the last thing I would have considered doing on my own.

The turning point for me was volunteering for the Outreach program

The point is that, if you'd asked me about the club in the first few months after I joined, I'd have talked enthusiastically about the meetings – the speakers, Ask an Astronomer, conversations on matters astronomical with people around me in the audience or around the refreshment table, and so on. If you'd asked after I joined the Outreach program, my response would definitely have included outreach activities. And now, I've learned so much and had a chance to get involved in so many different club activities through my involvement with the Board that it would be hard to come up with a comprehensive list of what's important to me about the club – though Anza, the Kuhn and the Board itself would be high on the list!

..the best reason for joining the club is the people.

That said, the best reason for joining and for staying a member is the people. I've talked to a lot of different members over my time in the club (I seem to spend a lot more time talking to people than observing, especially since joining the Board), and it seems to me that OCA has an exceptionally high percentage of thoroughly decent people as members. That doesn't mean that everyone gets along with everyone else all the time, or that people don't have individual quirks, but that just adds some spice to the mix. Overall, in my experience, if you want to be with people who genuinely live by such values as love of family, honesty, loyalty, and respect for hard work, without fanfare and without proselytizing, OCA is the place to be – especially if you also want to be with intelligent and knowledgeable people who share an interest in astronomy!

There's another point to be made here – in reality, there are different levels of membership in the club. A lot of members seem perfectly happy to stay at the periphery, going to meetings, reading the SA, maybe going to star parties or other events, but remaining largely uninvolved. Those who volunteer to help out with club activities and facilities start to discover a whole new world within the club, and contributing to the web of volunteer services that binds the club together and helps it to achieve its goals adds a level of satisfaction to club activities that you can't get any other way. Outreach is one of the easiest ways to volunteer – but there are innumerable ways to get involved, including such mundane activities as running a vacuum cleaner around Anza House when you're there. The change in attitude that is inherent in becoming a volunteer, from being one of the takers of club services to being one of the providers, gives a sense of connection to the club that those who never volunteer can never experience.

And, to top it off – there are health benefits to all this! According to a study reported in a recent issue of Science News (July 26, 2003), people who are "givers" actually live longer than people who are only takers. And there are other studies indicating that keeping your mind stimulated can ward off Alzheimer's disease – so there are two great ways that being active in the club can help improve your health. And, of course, volunteering out at Anza usually involves physical activity – great for the cardio-vascular system!

So, for all of you who haven't yet tried it – make sure you get the full value of your membership by becoming an active volunteer!

Sirius Fiction

While visiting San Jose a couple of months ago I came across the following story prominetly displayed in a science museum. It is reprinted here with permission from the author Terry Bisson.

I hope you enjoy it as much as I did!

Liam Kennedy

THEY'RE MADE OUT OF MEAT

by Terry Bisson

"They're made out of meat."

"Meat?"

"Meat. They're made out of meat."

"Meat?"

"There's no doubt about it. We picked up several from different parts of the planet, took them aboard our recon vessels, and probed them all the way through.

They're completely meat."

"That's impossible. What about the radio signals? The messages to the stars?"

"They use the radio waves to talk, but the signals don't come from them. The signals come from machines."

"So who made the machines? That's who we want to contact."

"They made the machines. That's what I'm trying to tell you. Meat made the machines."

"That's ridiculous. How can meat make a machine? You're asking me to believe in sentient meat."

"I'm not asking you, I'm telling you. These creatures are the only sentient race in that sector and they're made out of meat."

"Maybe they're like the orfolei. You know, a carbon-based intelligence that goes through a meat stage."

"Nope. They're born meat and they die meat. We studied them for several of their life spans, which didn't take long. Do you have any idea what's the life span of meat?"

"Spare me. Okay, maybe they're only part meat. You know, like the weddilei. A meat head with an electron plasma brain inside."

"Nope. We thought of that, since they do have meat heads, like the weddilei. But I told you, we probed them. They're meat all the way through."

"No brain?"

"Oh, there's a brain all right. It's just that the brain is made out of meat! That's what I've been trying to tell you."

"So ... what does the thinking?"

"You're not understanding, are you? You're refusing to deal with what I'm telling you. The brain does the thinking. The meat."

"Thinking meat! You're asking me to believe in thinking meat!"

"Yes, thinking meat! Conscious meat! Loving meat. Dreaming meat. The meat is the whole deal! Are you beginning to get the picture or do I have to start all over?"

"Omigod. You're serious then. They're made out of meat."

"Thank you. Finally. Yes. They are indeed made out of meat. And they've been trying to get in touch with us for almost a hundred of their years."

"Omigod. So what does this meat have in mind?"

"First it wants to talk to us. Then I imagine it wants to explore the Universe, contact other sentiences, swap ideas and information. The usual."

"We're supposed to talk to meat."

"That's the idea. That's the message they're sending out by radio. 'Hello. Anyone out there. Anybody home.' That sort of thing."

"They actually do talk, then. They use words, ideas, concepts?"

"Oh, yes. Except they do it with meat."

"I thought you just told me they used radio."

"They do, but what do you think is on the radio? Meat sounds. You know how when you slap or flap meat, it makes a noise? They talk by flapping their meat at each other. They can even sing by squirting air through their meat."

"Omigod. Singing meat. This is altogether too much. So what do you advise?"

"Officially or unofficially?"

"Both."

"Officially, we are required to contact, welcome and log in any and all sentient races or multibeings in this quadrant of the Universe, without prejudice, fear or favor. Unofficially, I advise that we erase the records and forget the whole thing."

"I was hoping you would say that."

"It seems harsh, but there is a limit. Do we really want to make contact with meat?"

"I agree one hundred percent. What's there to say? 'Hello, meat. How's it going?' But will this work? How many planets are we dealing with here?"

"Just one. They can travel to other planets in special meat containers, but they can't live on them. And being meat, they can only travel through C space. Which limits them to the speed of light and makes the possibility of their ever making contact pretty slim. Infinitesimal, in fact."

"So we just pretend there's no one home in the Universe."

"That's it."

"Cruel. But you said it yourself, who wants to meet meat? And the ones who have been aboard our vessels, the ones you probed? You're sure they won't remember?"

"They'll be considered crackpots if they do. We went into their heads and smoothed out their meat so that we're just a dream to them."

"*A dream to meat! How strangely appropriate, that we should be meat's dream."*

"And we marked the entire sector unoccupied."

"Good. Agreed, officially and unofficially. Case closed. Any others? Anyone interesting on that side of the galaxy?"

"Yes, a rather shy but sweet hydrogen core cluster intelligence in a class nine star in G445 zone. Was in contact two galactic rotations ago, wants to be friendly again."

"They always come around."

"And why not? Imagine how unbearably, how unutterably cold the Universe would be if one were all alone ..."

the end

Astronomy to Go

by Dave Kodama

As we've seen in previous installments in this series, the farther you are traveling, the more stringent the requirements placed on your equipment. But no matter how close your destination, light weight and compactness are the primary requirements for all of your equipment, and it starts with your scope. Against those requirements, we compromise as necessary to meet our observing goals for a particular trip. Why the emphasis on weight and size? For one, you will probably be carrying your equipment at some point in your travels. This may normally be as short a trip as between your house and car, but could also sometimes include a hike up a hill to set up, or a long walk between gates at an airport. Try carrying your equipment around the block in your neighborhood. Can you make it? I've had numerous occasions involving long walks to the observing site, including carrying my equipment up 2 flights of steps at 10,000 feet of elevation.

The other complication of ignoring the need for light weight and compactness is that the luggage case you put your equipment in has to grow in size and weight as your scope gets bigger, not to mention the tripod or mount that the scope must sit on. The problem clearly rapidly gets out of hand! So having identified the core problem, we need to carefully consider the astronomy goals for our trip and limit the equipment to cover those needs and no more.

For strictly visual observing, life can be simple. For night-time wide field viewing, even a small pair of 10x25 pocket binoculars (or a monocular) can be a big improvement over just naked eye viewing. These small binoculars can be easily obtained at sporting goods stores and can be inexpensive, but just make sure to look through them before purchasing. If objects seem hazed over when looking at distant objects such as trees, select another brand as good contrast is important for enjoyable night viewing. I always take a set of these small binoculars in addition to other equipment since they are so small they can even fit in my pocket. Larger binoculars from 7x35's on up may be OK too, but extended viewing with large binoculars will probably necessitate carrying along a tripod or other support mount.

If you're going to be enjoying the southern hemisphere skies, don't forget to also take a decent set of star charts to find your way around. Wil Tirion's Bright Star Atlas (8-1/2x12") is a good match for binoculars and doesn't come in the form of a thick book. For more detail, take just selected charts out of the larger Sky Atlas 2000 field edition set (13-1/2x18", unbound).

If you want to go the next step and take a telescope, a small (4" or less) folded optics type telescope (SCT or Maksutov) is one of the most compact solutions. New scopes are available from manufacturers such as Meade and Questar, or consider used ones, such as the Bausch & Lomb 4000 manufactured in the 1980's. Also notable is the fact that a 4" f/12 SCT, like the B&L I've used, is just about right for seeing the entire sun when viewing (or photographing) an eclipse. My preference for strictly visual use is to not get a scope that includes a special mount, but rather to select a scope that can be directly mounted on a video tripod. The video tripod with a smoothly panning head is not only also useful for conventional (daylight) photography, but also great for pointing and tracking an object with a lightweight scope.

These days, another available scope alternative is a short focal length 2-4" refractor. Older achromatic designs with f-ratios of f/12 or f/15 were very unwieldy because the tubes were so long, but modern designs are a very compact f/6 or f/7. For travel use, look for niceties such as lightweight tubes, collapsible dew shields, and integral ¼-20 mounting holes for use with video tripods. My current favorite is a 3" Borg (f/6.6) which also has the benefit of allowing disassembly into even shorter pieces. Note that these short refractors might be considered as having a bit too short a focal length for eclipse viewing or photography, but a good quality objective can be extended with a 2x or 3x Barlow or (photographically) with a teleconverter to reach the longer focal length desirable. ·

If you have been into astronomy very long at all, you will certainly have arrived at the conclusion that no single scope will satisfy all requirements, even when traveling is not a consideration. No doubt, many of us have an astronomical "toolbox" with numerous telescopes, each suited for a particular type of observing. The task at hand is to select one single tool to take with us! Here's a quick first pass at trying to gather some general pluses and minuses regarding different scope types: ■

Telescope type	Comments for travel	Advantages	Disadvantages
Newtonian reflector	Typically fast f-ratio, 6" diameter mirror or larger	Low cost, medium weight for a given aperture, wide-field views	Usually bulky for reasonably sized aperture, field collimation usually required, small apertures generally not available
Maksutov	Typically slow f-ratio 3" diameter or larger	Compact for long focal lengths	Generally heavy for a given aperture, narrow FOV, high cost
Schmidt-Cassegrain	Typically medium to slow f-ratio, 4" diameter or larger	Compact for medium-long focal lengths, light to medium weight for a given aperture, medium to low cost	Image quality compromises - more scattered light
Refractor	Medium f-ratio, 2-6" diameter	Good for wide-field views, photography	Long tube for larger apertures, high cost for a given aperture

Stellafane 2003

By Matthew Ota

After a long flight to Boston and a drive up into the green country of Vermont, a familiar small pink and black A frame sign is seen on the side of the road. It is the entry point to Stellafane, the birthplace of amateur telescope making.

After receiving the convention packet and proceeding to the general parking area, I proceeded to the gift shop/first aid area, as it was where most of the people were congregating.

This being my second trip to Stellafane, I was not surprised by the wet conditions and was well prepared with a large umbrella. The Stellafane organizers were also well prepared, as the official Stellafane rain ponchos were a hot seller. Other items were for sale such as the Stellafane tee shirts, sweatshirts, coffee mugs, decals, bumper stickers and even the Stellafane toothbrush.

In the afternoon I visited the town of Springfield and the Hartness House, which is a bed and breakfast inn that was built by the former governor of Vermont. The R. W. Porter Museum of Amateur Telescope Making, located underground, was opened up at 1 p.m. It was a short trip down the stairs into the cellar, leading to a long underground tunnel. The tunnel was originally built so the users of the Hartness turret telescope could reach it without having to go outside into the cold weather. At the end of the tunnel is a room containing the original Porter and other early ATM artifacts. It was interesting seeing old examples of handmade reflector telescopes, and to see antique pitch laps and other grinding equipment. The old tools were identical to the ones still used today to grind mirrors.

Going beyond the museum there was a turn around a corner to a short flight of stairs. This led to the interior of the Harness turret telescope. The mechanical equipment in the turret was a bit rusted and worn, but still looked serviceable.

The real activity picked up on the second day, Saturday. The rain had gone away, leaving partly cloudy skies. I first went to the swap meet area, which was quite similar but smaller in scope compared to the swap meet at RTMC. The difference is that there are no commercial vendors at Stellafane

The shuttle bus to the clubhouse was still not running due to the mud, so the officials allowed private vehicles to drive up to Breezy Hill. After parking in a camping area, I proceeded to the shrine to the stars, the famous Stellafane Pink Clubhouse. The telescope entries were all set up in front of the clubhouse and behind the equally famous Porter Turret Telescope.

Being a history buff, it is hard for me to describe the feelings I had going into the clubhouse. I have read so many books about the ATM movement, Stellafane and Russell Porter, that it is almost a religious experience. The copy on the eaves reinforces this view, as it has inscribed the biblical quote "The Heavens Declare the Glory of God". This clubhouse is actually known as Stellafane, and that is where they derived the name of the convention.

It is more a museum than a clubhouse, nothing at all like our Anza House. It is much smaller, but full of tradition and history. There are early photographs of the Hale telescope at Palomar Mountain Observatory, reference books, at least one computer and other astronomy related items.

Outside of the clubhouse is a sundial built into the south wall, and the original Stellafane iron sign out in front. This is a cast iron figure that was made sometime in the 30s by an unknown craftsman.

In front of Stellafane is the famous Porter Turret Telescope. This year the door was locked and the optics were removed, probably due to the poor weather. But the telescope makes a great backdrop for snapshots. I posed in front of it with a second edition Scientific American Amateur Telescope Making book from the 1930s.

This year's telescope entries were arrayed around the hill in front of Stellafane. It was a much larger and

The famous Stellafane clubhouse

Matthew Ota next to the Porter Turret Telescope

diverse assortment of homebuilt telescopes than at RTMC. I enjoyed talking to the builders next to their telescopes. The equipment ranged from homebuilt metal refractors to elaborate wooden dobsonians.

While touring the Breezy Hill area, the ATM classes and seminars were being held in the big tent on the east side of the grounds. All of the talks centered around mirror grinding and finishing techniques. I was able to get some expert advice afterwards on how to repair a small mirror I am working on.

In the evening there was a series of presentations in the amphitheater. It started with the tradition of finding out who was the oldest (John Dobson) and the youngest, a two month old baby. Then there were prizes awarded for the farthest traveled, and it went to Eric Ng from Hong Kong and Tan Wei Leong from Singapore. Then there was a prize awarded for the person who had attended the most Stellafane conventions.

The next event was David Levy's shadowgram, outlining the amateur telescope making movement. Then John Dobson gave an impromptu short talk on the lunar landing conspiracy theories and why they are wrong.

Next the ATM awards were given out. I was surprised to see that this year they did not televise interviews with the winners due to lack of time. However, the interviews are available online at the Stellafane web site at www.Stellafane.com

This year's keynote speaker was Alan Hirshfeld, author of "Parallax, The Race to Measure the Cosmos". His talk was on parallax, and the trials and tribulations of the many astronomers that tried to measure stellar distances throughout history.

Unfortunately, the Saturday evening observing session was not done at all due to complete cloud overcast, so this year's convention ended early that night.

There are many similarities between RTMC and Stellafane. Just like at RTMC, it is the people and not the events that really make it something special. I plan to return to it repeatedly in future years. It holds a special place in the hearts of many an astronomer.

The following was written by OCA Member Philip Trask. How appropriate that Ray Bradburys birthday should be so close to the Mars close-approach!

A Birthday Poem for Ray, On His 83rd Birthday

written by Philip Trask

Birthday greetings Ray, dear old friend of mine,
Another year has gone, just a tick in the cosmology of time,
The year's rounding finds Earth and Mars
as friends about to meet,
The Red Planet comes now closest,
his old friend Ray to greet,
For it's Ray's Birthday and the planet
is all puffed up and proud,
Mars is acknowledging Ray Bradbury
as the First Martian out loud.

Our telescopes point skyward
to make Mar's face better known,
As He tips his ice cap and shows just how large He has grown,
In birthday salute to his official storyteller on Earth below,
Who pointed at Mars and told us all why we should go,
So that Earthlings could become Martians
and begin the long journey into space,

Seeking God in the heavens and putting a smile on His face.

Someday we will go to Mars
and visit Martians in their new towns,
By spaceship this time we'll travel and then sit us down,
It will all seem familiar, deja vu from the past,
'Cause Ray's metaphors got there first,
set the scene and the cast,
We thank Ray, the First Martian,
when as tour guide,
storyteller and friend,
On those adventures into the future our hearts he did send.

So, let us honor Ray with remembrance
for contributions to prose,
For his books are now there on the shelves next to Collier,
Dickinson, Melville, and Poe's,
He took us to Mars with words of elegance and grace,
And shared his eternal optimism for Man's destiny in space.

For all that, we'll build a metaphor in stone,
And Ray will have a Martian town of his own,
We'll call it "Bradbury City", first on the Red Planet Mars,
And Ray will then have his name in the stars.

Happy Birthday Ray
Written by Philip Trask August 22, 2003

ASTROSPACE UPDATE

September 2003 *Gathered by Don Lynn from NASA and other sources*

To find out more on these topics, or those of past months' columns, through the World Wide Web, send your Web browser to our OCA Web site (http://www.ocastronomers.org), select Space Update Online, and the topics are there to click on.

The Very Large Array radiotelescope - has found a cloud of carbon monoxide gas around the most distant quasar known. It took light (and radio waves) so long to get here that we are seeing the quasar as it was when the Universe was 1/16th of its current age. The elements in this gas, as well as most matter other than hydrogen and helium, are produced within stars. So astronomers had not expected to find so much carbon monoxide there (about 10 billion times the mass of our Sun), since there had not been much time for galaxies and stars to form, much less produce much carbon monoxide. The quasar is powered by a black hole at least a billion times as massive as our Sun. A bubble of ionized gas about 30 million light-years across was found surrounding the quasar, supporting the theory that the first galaxies of stars to form caused a re-ionization of their surroundings.

Maxwell telescope - Scientists using the most sensitive camera operating in submillimeter wavelengths, those between radio and infrared, have discovered around the supernova remnant Cassiopeia A about 1000 times as much dust as previously believed that a supernova would throw out. This dust was previously not detected about any supernova because only dust that happened to be warm radiates in other wavelengths, while even cold dust radiates in submillimeter wavelengths. This helps explain how stars that are relatively rich in heavier elements managed to form very early in the history of the Universe. Although it was known that such heavy elements are produced in supernovae and within stars, it was not known until now how these would be distributed about space to make the next generation of stars much richer in these elements.

Hubble Space Telescope (HST) - has imaged a galaxy cluster about 4.5 billion light-years away to detect gravitational lensing of more distant objects by the mass of that cluster. A large concentration of mass bends light, acting like a cosmic lens, as predicted by Einstein's General Theory of Relativity. The result of studying the images is an accurate map of all mass in and about the galaxy cluster, including dark matter that cannot otherwise be detected. The density of dark matter drops sharply with distance from the cluster center. This does not support some theories of galaxy cluster formation that require large amounts of dark matter in their outer regions. Dark matter clumped around individual galaxies, even outlying ones that had not yet fallen into the cluster. This supports the theory that smaller galaxies form within their own lumps of dark matter, even before they collided to form larger galaxies. Such mapping of dark matter will be repeated on other galaxy clusters.

Another team of astronomers has used a similar technique (mapping matter from its gravitational lensing effects) using the CFH telescope in Hawaii to study the mass surrounding individual galaxies. They found that the dark matter halos extend up to 5 times as far as any visible stars, and contain more than 50 times as much mass as those stars. The halos were found to be slightly flattened, which is predicted by the cold dark matter theories. It remains a mystery what most of the dark matter is; it has been proved that most of it is not ordinary matter (protons and neutrons).

Hubble Space Telescope (HST) and the 10-meter Keck Telescope in Hawaii have imaged globular star clusters in the voids between galaxies. All globular clusters previously found orbited about galaxies. It is thought that these newly discovered globulars once orbited galaxies, put the gravity of passing galaxies ripped them loose.

Central disk in galaxy - It is believed that most large galaxies each have a supermassive black hole at the center, surrounded by a doughnut of gas and dust, which shapes outflow into jets coming out the hole of the doughnut. The Circinus spiral galaxy has unusually broad sprays rather than jets. New observations of this galaxy made with the Australia Long Baseline Array of radiotelescopes may explain this. They show that this galaxy has a thin warped disk of gas and dust, rather than a doughnut, surrounding the central black hole. The disk has a mass of about 400,000 Suns. Further such observations of galaxies will be made to determine how common thin disks are, and to understand why they differ from the doughnuts.

Exoplanets (planets outside our Solar system) - A study was made of 754 Sun-like stars in our neighborhood shows that the probability of having planets is directly related to the amount of iron and other metals in the stars. All the stars in the study have been searched for planets, so the statistics derived should accurately reflect the chances of having planets, at least ones that current technology can detect. 20% of the metal-rich stars (those with about 3 times the metal content that our Sun has) in the study have planets, while those with less than 1/3 the metal content of our Sun have only a 3% chance of having planets. The 29 stars with the least metal had no planets at all. All iron and almost all other metals are created within stars, and are spread about the galaxy by supernova explosions and other processes. This says that stars that formed early in the history of the galaxy have little or no metals, and by the new study, have little chance of having planets, while stars that formed later (which includes the Sun) have more metals and more chance of having planets. This had been theorized for some time, but this is the first definitive evidence gathered to prove it.

RHESSI (X-ray and gamma-ray solar observatory) - has discovered that microflares on the Sun's surface, a million times smaller than the already-known flares there, occur with such frequency that they appear to contribute significantly to the heating of the Sun's corona. This may solve the mystery of how the Sun's corona gets heated to millions of degrees. RHESSI is 10 to 500 times more sensitive than previous solar X-ray and gamma-ray instruments, so these microflares were not detectable until now. RHESSI has also discovered that some microflares jet through the corona with little heating effect, apparently because the magnetic field lines happen to be open-ended where these occur. This type of microflare appears to produce the long-known but previously unexplained radio bursts that sound like receding train whistles.

Galaxy Map of Early Universe - The first results have been announced of a study underway with a spectrograph on the Keck Telescope in Hawaii that takes spectra of 150 galaxies simultaneously. Galaxies are selected so that the light took between about 6 and 8 billion years to get here, in order to study that time period in the history of the Universe. Galaxies at that time were measurably less clustered than today. Comparisons of the early and late periods of the survey (a more than 2-billion-year period) show that galaxies were creating stars, forming black holes at their centers, falling toward other cluster members, and colliding and merging with each other. The degree of clustering was found to relate directly to age of the galaxies (determined by content of old red stars) and brightness of the galaxies (probably indicating more mass). Studies like this will fill in the gaps in our knowledge of how galaxies form and evolve.

Mars Odyssey - Scientists have completed analyzing neutron spectrometer data from Mars Odyssey, producing a complete map of that planet showing where water (undoubtedly frozen) exists in the near-surface soil. Many of the water-rich areas correspond to known Martian geographic features, such as the western slopes of the major volcanoes and the bottom of the Marineris Valley. The depth of these water-rich areas is not known, since the instrument is only sensitive to water within about a yard of the surface. If this represents the top of a deep water table, Mars could have substantial amounts of water. There are 2 theories on where all this water came from: 1) it came from the polar caps, which contain much ice, through some melting process, or 2) it formed in a past wet and warm period as liquid water, and froze when the climate changed.

Black holes and star formation related - Analysis of data on 120,000 galaxies observed as part of the Sloan Digital Sky Survey shows that galaxies with active black holes at their centers are much more likely to have active star formation and to be larger than average galaxies. The best current theory to explain this is that both star formation and activity about the central black hole require a large supply of cold dense gas. Thus the galaxies that have used up their supply of this gas have nearly stopped star formation and have nearly stopped the falling of matter into the central black hole. Larger galaxies have larger original supplies of gas, so that explains the other correlation found in this analysis. Falling of matter into a central black hole results in great frictional heating of the matter, which then glows brightly in both visible light and x-rays, constituting what we call an "active" black hole. This causes the black hole to grow in mass.

Oldest planet - A planet having 2.5 times the mass of Jupiter and about 11 billion years old has been found orbiting a pair of stars in the globular cluster M4, making it the oldest and farthest (from us) planet known. The pair of stars consists of a rapidly spinning neutron star and a white dwarf. The planet was detected and weighed by careful measurements of the pulses from the neutron star, as the planet's orbit tugged the neutron star back and forth, combined with HST measurements of the masses of the stars. All this data allowed calculation of the orbital tilt of the planet and the white dwarf and the planet's mass. This planet broke all the rules: planets should not form in globular clusters, which are quite deficient in the heavier elements needed for planet forming; planets should not survive the creation of a neutron star; and planets should rarely survive the gravitational tugs of two stars. The white dwarf is only 480 million years old, so it was captured by the neutron star comparatively recently, another event the planet should not have survived. When the white dwarf evolved from its predecessor ordinary star, it swelled up and dumped matter onto the neutron star, which spun it up to its present speed (nearly 100 revolutions per second), another event that the planet was lucky to survive.

Chandra (X-ray observatory) - Most X-ray sources found in globular star clusters have been found to be a collapsed star (neutron star or white dwarf) that is pulling in matter from an ordinary star in orbit about it. These are called X-ray binaries. A new study with Chandra has shown that the denser areas of clusters, where stars are more likely to have close encounters, also have the most X-ray binaries. The theory is that the close encounters allow capture of stars to form pairs, instead of the pairs being born together as a pair.

Instant AstroSpace Updates:

FUSE (Far Ultraviolet Spectroscopic Explorer) was given a new lease on life by loading new flight software into its computers, which will allow it to continue operations with any number of working gyroscopes and/or reaction wheels, including none; FUSE had already suffered failure of one gyroscope and 2 reaction wheels.

Einstein ring - The closest (6.3 billion light-years) Einstein ring image of a quasar has been discovered by the New Technology Telescope in Chile; an Einstein ring is caused by gravitational lensing of any object caused by a massive object (usually a galaxy or cluster of galaxies) exactly in front of it.

SOHO (SOlar and Heliospheric Observatory) - has been restored to essentially full operation, even though the pointing mechanism for the high-gain antenna is stuck; new procedures include use of other antennas, on SOHO and on Earth, changing data rates, more use of onboard data recording, and flipping SOHO over every few months. ■

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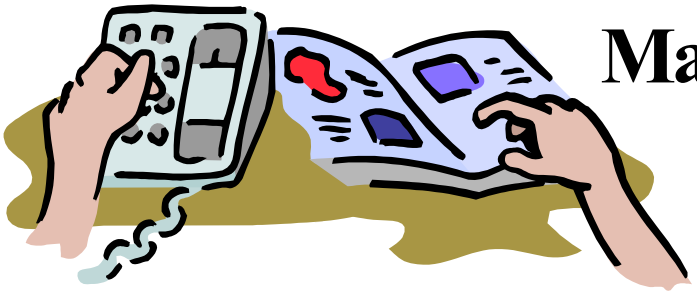

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