SIRIUS ASTRONOMER

NEWSLETTER OF THE ORANGE COUNTY ASTRONOMERS

See our web site at http://www.ocastronomers.org

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The Eagle Nebula in Serpens is one of the most well known and beautiful examples of hydrogen emission nebulosity. This image, taken by OCA Member Greg Pyros, was taken using a Meade Pictor 1616XT CCD at F3.3 through a narrow bandpass Hydrogen Alpha filter. The filter passes only a very narrow hydrogen band, and blocks most man-made light. The results speak for themselves. Find out from Greg, in next month's Sirius Astronomer, how to get started using this exciting technology.

CHAPMAN MEETING

Due to a scheduling conflict with our regular meeting date, the free and open club meeting will be held Friday, September 20th at 7:30pm in the Science Hall of Chapman Univ. in Orange. Featured speaker will be Mike Simmons.

STAR PARTIES

The Anza site will be open Saturday, September 7. Due to recent problems we are experiencing with the Kuhn Telescope drive, the observatory will not be open. The "new" Silverado site will be open for observing on Saturday, September 28th. Check the website calendar, and Anza WebCam, for late updates on star parties and outreach events.

COMING UP

The Astrophysics SIG will meet September 13th, the Astro-Imagers' SIG will meet September 17th, the EOA SIG will meet September 16, the next Beginners' Class is October 4, and the next general club meeting will be Friday, September 20th.

President's Message

by Liam Kennedy

Don't Panic!

As I write this month's letter for the Sirius Astronomer, I find myself in a world of semi-controlled panic. How does that saying go? "Time is nature's way of making sure everything doesn't happen all at once". Right now I feel that everything IS trying to happen at once.

After an incredible amount of dedication and planning by some outstandingly committed OCA members, we are all just about to experience AstroImage 2002. The planning and preparation for this three-day event has been truly phenomenal. By the time this Sirius Astronomer reaches you, the conference will have been completed. Therefore, I think it entirely appropriate that I formally thank everyone who has been involved with making the conference the success it has been. I know that many of the AstroImage conference planning committee really don't like to see their names "up in lights" – but I am afraid that I must give credit where credit is due. Please join me in personally thanking the following OCA Members for the truly exceptional dedication to this club and what it is all about:

Garth Buckles, Dave Kodama, Greg Pyros, Pat Stoker, Darren Thibodeau, Bill Patterson, and Stephen Eubanks.

This core group from the OCA AstroImagers have been meeting practically every single week for the past year. Their aim was to create the premier event on AstroImaging that all others will be compared to. They have undoubtedly achieved their goal.

In addition, other members have helped out for specific elements of the conference development including Matthew Ota, Barbara Toy and Charlie Oostdyk. Numerous members also volunteered to help out with the many on-site activities at the conference, including refreshments, shirt and hat sales, image gallery management, door monitors, and much more besides. Thank you so much; your help has made the conference the success it was.

Upper Newport Bay – Astronomy Program

Another "happening" that added to my own personal level of panic at this time was due to the implementation of a new introductory family-friendly astronomy program that I ran at the Peter and Mary Muth Interpretive Center in the Upper Newport Bay area on Friday August 16th. This was just a week before the AstroImage conference.

The OCA was approached by Grace Yick, a park ranger at the facility, to put on a simple introductory program that would attract visitors to their center. This 10,000 square foot educational facility has been built into the side of the bluffs on the north side of the Bay. It offers panoramic views of the Bay, yet is nestled so unobtrusively that few people are aware that the Interpretive Center has already been built and is open to the public.

I created an approximately hour-long presentation I hoped would be found appealing, especially to families with children. In addition to the presentation, we had five of our dedicated outreach volunteers with their telescopes set-up outside, to show the visitors the Moon and Venus (and whatever else could be seen through the thin and low clouds that had come into the bay).

I really had no idea how many people would turn up. The center often runs events that require pre-registration – but as this was the first one of its kind there was no registration required. In the end – by around 7pm we had their theatre filled to capacity with people standing (approximately 100 people I would guess). The program was designed to be very interactive with lots of audience participation – especially from the younger members of the audience.

I feel certain that we helped fan the flames of curiosity for Astronomy in many of the young and inquisitive minds that were there. A number of the families I spoke with will move on to our own beginner's program hosted by Antonio Miro. Other people who attended will undoubtedly join up as members right away. Mission accomplished!

The September program will be on Saturday 14th at 7pm. I will need to come up with a slightly different program – as I know that many of those who attended this time are planning on returning.

For details you can view the web page at:
http://www.ocastronomers.org/features/fa_newportbayAug2002.htm

The September OCA Meeting is on September 20th

I know that you will have no-doubt seen the many notices regarding the change in the date of the September OCA meeting. We are very sorry to have to do this – and it was unexpected. We do get free use of the Chapman facility and we are forever grateful that we have so few scheduling conflicts. When a scheduling conflict arises we try to publicize the change as widely as possible to ensure that no one turns up when we are not there. See you on September 20th at 7:30pm!

Liam Kennedy
"Every day we are connecting ever more photons of light from distant galaxies to the eyes, hearts, minds and imaginations of our members and others in our community."

From the Editor

September is one of my favorite months of the year for visual astronomy, since it gives us a great variety of celestial objects to enjoy. In the early evening, Sagittarius is high in the south as the sun sleeps for the evening. And yet, by early morning we get a taste of the vast universe outside of our own Milky Way Galaxy, as we look up and out of the Galactic plane toward distant galaxies and nebulae in Orion and Monoceros, before the sun wakes once again to start a new day.

Of course imaging the sky is my real passion, as it allows me to share the views of these distant objects and worlds with others. I suppose it is one of the reasons I wanted to be the editor for our magazine. It is to have the opportunity to allow us to share our views, experiences and passions with one another, even if only on a monthly basis.

You may have noticed an improvement in the Sirius Astronomer beginning with last month's issue. We now have a better quality print process that will allow us to bring you more images than ever before. We can even provide you with the magazine in color and will do so once a quarter. The changes the Sirius Astronomer is undergoing are exciting, and I am glad to be able to be a part of it! I am also grateful to Liam Kennedy, for his help during this transition, and to Elaine Vander Linden, whose spirit and attention to detail make this job fun!

As always, however, the magazine is only as good as its content. In the past, we have enjoyed many interesting articles from our members. With the changes in quality and format, we will be able to enrich Sirius Astronomer to attract more content, and produce a first class publication. I am looking forward to seeing your submissions on my desk.

Several individuals are monthly contributors to the magazine. Please join me in thanking those individuals whose names have appeared consistently in Sirius Astronomer. I would also like to thank Chris McGill for her time and devotion to the past issues of the Sirius Astronomer. Without her efforts, my job would be much harder. Thank you Chris and best of luck.

Darren W Thibodeau

MYKE COLLINS, MINOR WHITE

The ultimate goal of asteroid hunters is to have their discoveries given a permanent number by the MPC (Minor Planet Center). The MPC will assign the permanent number only after the asteroid's orbit is well enough established that the asteroid can be located years later with precision. This typically requires many observations over about four separate oppositions. Once numbered, of course, the discoverer may name the asteroid.

There are numerous levels of confidence between the initial discovery of an asteroid and the awarding of a permanent number, ranging from a single night observation ("one night stand") through observations over multiple oppositions. Observations from two separate evenings are the minimum required to secure a designation (for example, 2000 OA_{61}) from the MPC. Afterwards, if further observations are not made to further determine an asteroid's orbit, then the asteroid is considered "lost."

There are many reasons why asteroids are sometimes lost after receiving a designation. These include weather, scheduling, equipment limitations, the full Moon, and even unusual orbital characteristics of the asteroid. The re-discovery of a lost asteroid can present technically challenging and interesting detective work. We are now collaborating with several other observatories not only to re-discover our lost objects, but theirs as well.

Our discovery total now stands at twenty-six (see table, below), one of which is a relatively rare Jovian Trojan. The MPC has assigned a permanent number to six of our discoveries:

DISCOVERIES ROSTER

MPC Observatory Code #643

Designation	Discovery Date	IAU Number	Name	size (km)	Arc
1999 RG_{43}	9/3/99	40457	See text	2-5	4o
1999 RP_{33}	9/3/99			2-5	2o
1999 RQ_{33}	9/3/99			3-7	3o
1999 RR_{33}	9/3/99	21684	Alinafiocca	2-5	4o
2000 KN_{38}	5/26/00			2-4	2o
2000 KO_{38}	5/26/00	32096		3-6	4o
2000 KP_{38}	5/26/00			3-6	3o
2000 LF_{15}	12/14/00	41450		2-4	4o
2000 NF_{29}	6/30/00			3-6	3o
2000 OQ_{7}	7/27/00	32207		3-7	4o
2000 OR_{7}	7/27/00	32208		4-9	6o
2000 OA_{61}	7/27/00		**Note 1**	11-24	4o
2000 TH	9/26/00			3-6	2o
2000 TJ	9/26/00			1-3	61d
2000 SL_{233}	9/29/00			3-6	3o
2000 TJ_{2}	10/1/00			1-3	33d
2000 TK_{2}	10/1/00			1-3	2o
2001 KN_{21}	5/21/01			2-4	15d
2001 KQ_{50}	5/23/01			3-6	3o
2001 OJ_{22}	7/18/01			2-5	2o
2001 OK_{22}	7/18/01			2-4	37d
2001 OL_{22}	7/18/01			2-5	89d
2001 OG_{77}	7/22/01			2-5	5o
2001 OF_{91}	7/18/01			2-4	41d
2001 QB_{154}	8/15/01			3-6	92d
2001 QO_{108}	8/23/01			3-6	92d

"Arc" represents time coverage for all observations (d=days, o=oppositions)

Note 1: This asteroid is a Jovian Trojan

Moving on…

We are extremely grateful for the opportunities opened up to us by the Kuhn telescope. It has provided us with the platform from which we were able to create unique techniques for processing and reducing astronomical CCD images. These techniques, which are not available in the popular commercial astronomy programs, have enabled us to spot and reliably measure objects as faint as magnitude 22 in our Kuhn images. Our astrometry, or reporting of asteroid positions, was usually accurate to within 0.3 arcsecond, which is not bad considering our pixel size was 1.5 arc-seconds!

Using these tools developed for the Kuhn, we are now turning in observations from larger telescopes. These observatories did not, or could not, detect these objects in their own images. As a result of this collaboration, one of our discoveries (1999 RG_{43}) has just been given a permanent number (#40457). This milestone signifies our foray beyond Anza and into working partnerships with these observatories.

With gratitude, we recognize that William Kuhn made it possible for us to meet this astronomical milestone. In addition to making our asteroid discoveries possible, Mr. Kuhn has spent his life helping others in the field of astronomy. He has contributed generously to the astronomy classes of Orange County's colleges and universities, and helped many amateurs design and complete their own telescopes.

In honor of him, we have submitted the following citation with the proposal that the IAU (International Astronomical Union, which governs all naming and nomenclature) name 1999 RG_{43} after him:

> "William Kuhn lives in Orange, CA USA. He designed and directed the building of the 55cm Kuhn telescope at Anza California for the Orange County Astronomers. This telescope has been used for the discovery of numerous asteroids. Mr. Kuhn has dedicated his life to educating, assisting and inspiring astronomers of all ages.

Recent results…

One of the more dramatic examples of our current work is 2000 KN_{38}. This little object is only 3 km (two miles) in diameter. We discovered it on May 26, 2000, but were only able to track it for 37 days before it faded from view. We had learned enough about its eccentric orbit to realize that it only gets brighter than magnitude 21 about once every four years. We had discovered it just two days after its perihelion, at its brightest possible magnitude of 19.1. With only a 37-day arc, it would be extremely difficult to ever recover this object. We considered it to be "lost".

We have recently succeeded in spotting the asteroid in images from other observatories. It was dimmer than magnitude 21. With the submittal of this latest data to the MPC, we have established a solid two-opposition arc for this object. Now the MPC will be able to link this asteroid to observations from even more observatories, putting it on the fast-track to becoming numbered.

2001 KN_{21} is another success story. We discovered it on May 21, 2001, then recovered it on May 23 and May 25, giving us discovery credit and a designation – but only a four-day arc. We made several more attempts to follow this magnitude 20 asteroid as it darted through the crowded Milky Way, but failed to ever spot it again from Anza. We finally admitted that it was lost.

In July 2002, we identified 2001 KN_{21} in a set of NEAT (Near Earth Asteroid Tracking) images taken May 10, 2001, giving us a 15-day arc. With the improved orbital elements, we were able to locate the asteroid in other images, further refining the orbit so that we can recover it during its future apparitions.

Amateur Opportunities…

Amateurs are frequently discouraged from searching for new minor planet discoveries. There is a common misperception that the automated NEO (Near-Earth Object) surveys are "sweeping up" all remaining discoveries that are within the reach of amateur equipment. It is true that the surveys employ sophisticated software, large telescopes, sensitive CCD cameras, and can cover hundreds of square degrees in a single evening. However, the surveys cannot cover the entire sky in an evening nor can they identify all the asteroids that are captured in their images. Devoted amateurs continue to turn in many new asteroids every month, as evident in the statistics reported by the MPC (http://cfa-www.harvard.edu/iau/mpc.html).

The list of "lost" asteroids grows longer every month. Most asteroids become lost because there are not enough astronomers to track all of them and because the asteroids were not discovered early enough in their retrograde cycle. The field of asteroid discovery and tracking is an activity where an individual's creativity can make important contributions to the astronomical community. In addition, thousands of new asteroid discoveries await dedicated amateur astronomers in the years to come.

Additional information and research updates are available at our website (www.mpc643.org). The links provided there may be used to email us any inquiries that you might have.

SEPTEMBER'S FEATURED SPEAKER

Mike Simmons from the Mount Wilson Observatory
"Mount Wilson Observatory, Then and Now"

Mount Wilson Observatory is undergoing changes and updates and continues to be a useful scientific tool for astronomers. Mike will tell us what changes are taking place and share some of the history of this famous observatory overlooking the Los Angeles basin. Make no mistake about it, Mount Wilson Observatory is more than just history.

About Mike Simmons – Mike Simmons developed an interest in astronomy and space exploration at a very early age, excitedly watching the "Space Age" unfold during the 1950's and 1960's. Following an adolescent hiatus from astronomy, his interest was rekindled as a young adult when he could afford the toys of the hobby. Finally an active amateur astronomer in the 1970's, he joined the Los Angeles Astronomical Society and served as the society's president, vice president and just about everything else throughout the decade.

As an operator of the 12-inch Zeiss refractor at Griffith Observatory, he loved bringing astronomy to other excited youngsters of all ages. He later served as the president of the Mount Wilson Observatory Association several times -- an organization he helped found to support the observatory's efforts to welcome its many public visitors -- and he remains involved at Mount Wilson over 20 years later. He has combined his interests in travel, history, diverse cultures and nature on trips to total solar eclipses and he remains in touch with newfound astronomy friends in far away places.

Though Mike majored in astronomy at UCLA he migrated into research at the UCLA Medical Center where he could better support his young family. Now with an empty nest, Mike and his wife Sherri live on a small lake in a rural area just outside the big city and bright lights of Los Angeles.

August Events

By David Kodama

August turned out to be a rather "quiet" month, astronomically speaking. Except for Venus, the bright planets were all flirting with the Sun in August. Only the outer planets were really in much of a position for viewing and they take a large scope for serious viewing. However, a few special events did make it somewhat interesting to look up this month – the Perseid meteor shower, and a near-miss by a wandering asteroid designated 2002NY40.

2002 Perseid Meteor Drizzle

The annual Perseid meteor shower turned out to be more of a light drizzle this time, despite favorable viewing conditions (no interfering moon). Or perhaps it was because the 2001 Leonid shower was a tough act to follow. Reports on the Net were pretty consistently describing observations of mainly dim meteors and a rather low meteor rate. Photographically, the diehard meteor hunters, Wally Pacholka and Bob Yen, can always be counted on to capture the lion's share of Perseids for those of us who can't stay up all night for several days. Beyond the output of those two dedicated photographers, there were only a very few photographic examples for this year:

http://www.astropics.com/	OCA's Wally Pacholka
http://www.comet-track.com/meteor/perseids02/perseids02.html	Bob Yen (CA)
http://home.datawest.net/jkolb/precipice_perseid.htm	Jon Kolb (Colorado)

For those unfamiliar with what must be done to catch the flash of a meteor – in my experience, even at the peak of the shower, it typically takes a hundred frames to catch a single Perseid meteor (or a heck of a lot of luck). And that one meteor may be so dim that it is hardly distinguishable from a scratch on the film! This year Wally reported to me that he had 5 cameras going and shot 406 frames over two nights to yield two good meteors and a few more faint ones. Keep that in mind as you sit in your easy chair enjoying these photos on the Net!


Photo Coutesy of OCA member Wally Pacholka

2002NY40 – A Bullet Dodged

Perhaps the most exciting highlight of the month was the close passage of asteroid 2002NY40. This asteroid was detected July 14th by the 1-meter robotic LINEAR scope. Subsequent observations indicated an irregularly shaped object about 500 meters across and a path which would take it relatively close to the Earth, though farther away than our moon. The extra significance was that it was predicted to be visible in amateur telescopes (or even binoculars), so not surprisingly, there were quite a number of good images captured by amateurs:

http://www.xs4all.nl/~carlkop/ny40.html	(includes animation)
http://www.netway.com/~dboyle/NY40.html	
http://www.hiddenloft.darkhorizons.org/Other/2002NY40.htm	
http://www.geocities.com/lynol1000/2002_ny40_08172002/index.html	(includes animation)
http://astrosurf.com/jwisn/ny40.htm	(includes animation)

Be sure to check out the last page by Jan Wisniewski. He has assembled a video sequence of the asteroid's motion on both August 17th and 18th. The difference in speed across the field of view from day-to-day is striking!

*You can also get **weekly email notices** of what's going on in the OCA by sending a request to me at: kodama@alumni.cal-tech.edu.*

AstroSpace Update

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 website http://www.ocastronomers.org and select Space Update Online.)

Chandra (X-Ray Observatory) - Chandra (X-ray observatory) - has found large hot bubbles of gas above and below a nearby dwarf galaxy (NGC 1569), and a disk of hot gas about it, much enriched from ordinary intergalactic gas with heavier elements, such as oxygen, neon, magnesium, and silicon. A burst of star formation and supernova explosions has been ongoing in this galaxy for 10 to 20 million years, probably triggered by a collision with a massive gas cloud. Because it is a dwarf galaxy, its escape velocity is less than large galaxies, and the speed with which supernovae are throwing off gas is enough to allow these heavy elements to escape the gravity of the galaxy. Dwarf galaxies are the most common type in the universe. This observation brings up the possibility that much of the spread of heavier elements throughout the universe is a result of this kind of starburst action in dwarf galaxies. The Big Bang left the universe filled with essentially only hydrogen and helium; the heavier elements are created by stars during their normal life and by stars exploding in supernovae. The means of spreading these heavier elements throughout the universe, necessary to form planets and life, is still under debate, and this new Chandra observation should help understand this process.

Chandra also has discovered part of an intergalactic web of hot gas (300,000 to 5 million degrees C.) connecting galaxy clusters. It is believed to lie in the same regions as much of the dark matter of the universe, so further study of this hot gas in X-rays should help us understand the dark matter. The best theories of how the galaxies and clusters of them formed in the early universe is that the dark matter, much of which consists of unknown particles, along with the accompanying ordinary matter (mostly hydrogen and helium then), collapsed under gravity into a sort of web-like structure. The densest portions of this structure then further collapsed into what became galaxy clusters. The first evidence for this web-like structure was found many years ago by studying the locations of galaxies over very large regions (billions of light-years) of space. Now Chandra has for the first time found hot gas along some of these same structures, including the one in which the Milky Way lies. Cooler gas had been found in such structures by observing in ultraviolet. It is believed that only about 20% of the gas in the universe collapsed into the galaxies forming in the early universe, and even less into the stars in those galaxies, so there should be more hot gas in the web-like structures than all the material in all the stars. Different groups of astronomers used two different methods of detecting the gas: by looking for the X-rays it emits directly, and by looking for the X-ray spectrum it impresses on light passing through it from more distant objects (quasars).

Hot gas around galaxy clusters - For about 30 years astronomers have been trying to figure out why the hot gas around galaxy clusters does not cool down. We know the temperature of the gas from the spectrum of its X-ray emission. An extensive computer simulation of the interaction of jets shooting out from the centers of galaxies interacting with the surrounding gas has solved the mystery. Every time the gas starts to cool, its pressure drops, allowing it to fall into the supermassive black holes found at the centers of most galaxies. This infalling material stimulates the accretion disk and jet action of the black hole, which results in the jets reheating the gas. This process acts like a thermostat, keeping the temperature of the surrounding gas relatively constant. It results in cycles of gas falling into the centers of galaxies over time.

Brown dwarfs and disks - Observations by the 3.6-meter telescope in Chile of eight nearby brown dwarfs in mid-frequency infrared have shown that young brown dwarfs tend to have dust disks about them, and older ones do not. These were the first observations of these objects from the ground in these frequencies. Brown dwarfs don't have enough mass (less than 8% that of our Sun) to achieve high pressures required to start the nuclear burning of hydrogen like stars do, so they simply fade as they cool over millions of years. Because they are so dim, none were observed until 1995, and there are still comparatively few known. Because they are too cold to give off much visible light, they are best observed in infrared. The ages of brown dwarfs can be measured because younger ones have more lithium in the spectra. There are three theories on the formation of brown dwarfs: 1) they form like stars do, out of collapsing gas clouds, but just don't have enough material in the cloud, 2) they form as part of a multiple star system, and are disturbed out of the system before they finish forming, 3) they form as planets do, out of the dust disk left after a star forms, and there is not enough material in the disk to form a star. The new observations support the first theory, since that method should form a dust disk about the brown dwarf, and dust disks are known to dissipate after millions of years. Future observations with more sensitive instruments will be required to determine if planets can form in the dust disks about brown dwarfs.

Oldest crater - Scientists have found evidence of the oldest meteorite crater on Earth, for the first time dating to the period known as the heavy bombardment, about 3.8 billion years ago. The evidence consists of rocks from west Greenland containing unusual amounts of certain isotopes of the element tungsten, matching those usually found in meteorites. The heavy bombardment was discovered many years ago by dating craters on the Moon, where craters last almost forever, unlike Earth. A very large number of craters there are nearly 4 billion years old, indicating there was a period then of far more frequent collisions of meteorites with the Moon, and presumably all inner planets.

Martian possible fossils debate continues - The scientists who have been promoting the theory that a meteorite (known as ALH84001), known to have fallen to Earth from Mars, contains evidence of bacteria-like life on Mars, have announced another study. It claims that 25% of the magnetic material in that meteorite has a combination of properties that most such magnetic crystals made by bacteria possess, but no other naturally occurring material has. The properties include chemical composition, external physical structure of the crystals, and internal structure. The magnetic crystals are found in material within the meteorite that has been dated as being older than the oldest fossils of life found on Earth.

Compton Gamma Ray Observatory (GRO) - An analysis of nine years of data from the now defunct GRO has found that galaxy clusters probably emit the majority of gamma rays from outside our Milky Way galaxy. This may resolve the 30-year-old mystery as to their origin. It was already known that gamma rays from within our galaxy are largely produced by cosmic rays (atomic particles moving near light speed) colliding with interstellar gas, and also to a lesser extent by black holes and neutron stars. The study found that the area around large galaxy clusters was statistically brighter in gamma rays than other regions, and the larger the cluster, the more gamma rays. Galaxy clusters contain up to several thousand galaxies. Their huge mass attracts, by gravity, material from surrounding space. The theory that best fits the GRO data is that electrons in the material falling into galaxy clusters are accelerated by magnetic fields, then collide with light of the cosmic microwave background to produce gamma rays. The data did not fit as well a competing theory that the gamma rays are produced by supermassive black holes found in the centers of many galaxies. The Gamma-ray Large Area Space Telescope scheduled to launch in 2006 should verify this and provide greatly increased resolution in detecting gamma rays.

Earth's equatorial bulge growing - Satellite data since 1998 indicates that the bulge around the equator of the Earth has been growing slightly, while it was shrinking up until then. The previous shrinking had been explained as post-glacial rebound. The Earth during the ice age more than 10,000 years ago had its temperate and polar zones crushed down by the weight of glaciers, accentuating the bulge of land about the equator. Ever since the ice age ended, the temperate regions have been slowly recovering, allowing the equatorial bulge to sink back to its equilibrium height. The bulge is measured by ultra precise laser tracking of satellites, observing tiny changes in their orbits caused by the gravity of the bulge, and also by measuring tiny changes in the length of the day, caused by the same effect that changes the rotation speed of a skater when pulling in her arms. Scientists don't believe that the bulge change in the last four years can be due to movement of the ground, so it has been attributed to a movement in mass of the atmosphere, oceans, or ice. Recent measurements of the air and ice movements seem to have ruled out those, so now they are searching for changes in the density or height of oceans. Measurements of the ocean height by the TOPEX/Poseidon satellite indicate a rise in equatorial regions during this time period that may be of the right amount, depending on the salinity and temperature of that water, which are not precisely known. More information should be available with the recent and imminent launches of satellites, such as GRACE, JASON and ICESAT, which will measure properties of our oceans.

Merging black holes - New computer simulations of galaxies colliding have shown that generally when galaxies collide, the supermassive black holes at their centers will also collide, and merge into a larger black hole. The alignment of the new larger black hole will be changed from that of either previous black hole, even if one was much larger than the other. This fits with some observations, particularly radio telescope observations, which show jets from such black holes have changed direction in the past. These typically have an X shape in the center of the galaxy, remnants of the old and new jets. Nearly every galaxy that has been imaged with very high resolution has shown supermassive black holes in their centers, with millions up to billions of times the mass of our Sun.

CONTOUR (Comet tour mission) - As we go to press, the spacecraft has failed to respond to radio contacts, ever since its STAR 30 solid rocket was scheduled to boost it from high Earth orbit to a path toward its target comets. A visual search for CONTOUR produced two objects in about the right place, leading scientists to fear that the spacecraft broke in two during the rocket burn. At the time of the burn, CONTOUR was positioned such that none of the Deep Space Network antennas could see it, so we don't have any telemetry that might tell us what went wrong. Efforts to command the spacecraft to reset and contact us are continuing.

Mt. Wilson camera - The 100-inch telescope on Mt. Wilson has been fitted with a new infrared camera with innovative optics that allow masking bright objects to allow detection of dim objects nearby. Infrared observations are not bothered so much by the light pollution of Los Angeles as are those in visible light, so this new infrared capability was expected to allow the old telescope to again make significant discoveries. At first light the camera discovered three very dim red dwarf stars in orbit about nearby normal stars (27 to 200 light-years away). All were about 1/10 the mass of our Sun.

SPIDR (orbiting spectrograph) - NASA announced the selection of SPIDR as a new Small Explorer mission to be launched in 2005. The mission will map the hot gas that forms web-like structures throughout the universe, by taking spectrographic measurements. It should answer questions about the formation and evolution of galaxies and clusters of galaxies, and the hot gas within our Milky Way.

Astrollaneous

FROM THE OCA LIBRARIAN: A request for recommendations for the library goes out from your librarian, Karen Schnabel: I would like to start expanding the library's offering, yet I don't know where to start. I have had a couple of suggestions from members and will start searching for those particular books. However, I would like everyone's input. This is your library and I want it to be the best it can be! Please e-mail me at karen@schnabel.net with any ideas for books or publications you'd like to see show up in the library. I will attempt to find as many as I can, so hopefully you'll be seeing them in the near future.

FROM THE EDITOR: During some email correspondence with Christ Butler we asked "What's up Chris?" He writes: "My daughter, Diana Elizabeth Butler, was born at 12:31 AM August 7, at Los Alamitos Medical Center. Dr. Helen Mahoney, former OCA president, presided over the festivities. Tracy endured 21 hours of labor, and although exhausted came through fine. Diana similarly showed flying colors right off the bat. Measuring 21 inches and weighing 7 lbs 8 oz, Diana was "practically perfect in every way". Maybe we should have named her Mary Poppins Butler. Diana emerged sporting a full head of auburn hair - the eyes have not yet settled into the final color, but Dad is betting on green. I am not alone in remarking that this is one gorgeous baby, despite an eerie resemblance to her father; it must be Tracy's exotic Lebanese influence!

The name was long considered; Diana honors the goddess of the hunt and moon, to honor her grandfathers who both worked on the Apollo program. Elizabeth is for the strong female role models of at least two British queens, and also for my mom. Since coming home, Diana lost some weight and endured a little jaundice (meaning a momentary disruption of her otherwise angelic patience, and no sleep for us). However, with the help of many good friends such as OCA's Kathy Weinberger and Suzanne Hall (Auntie Kathie and Auntie Suzanne) all is back on track now. Diana is incredibly sweet, and even her cry is soft and staccato, wavering like a little chittering chipmunk.

I would like to thank the OCA in general for their kindness; Tracy and I do not have a lot of family around, and the extended astronomical community has been out of this world. We are still getting our sea legs as new parents, but this amazing young lady has gotten a great start on an adventure that may very well include some of the 22nd century. Although there is no pressure, I have a little blue jumpsuit with space patches on it waiting for her. There are also a few planets waiting."

Congratulation Chris and Tracy!

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