LOCATION CHANGES

Due to the upcoming re-opening of Griffith Observatory, the following changes have been made to the following venues:

The September and October General Meetings will be held at the Griffith Observatory Satellite, but there is a possibility that they won’t be held in the Planetarium, but in the Administrative trailer to the South and East of the Planetarium trailer (to the right and behind if you’re facing the front of that trailer).

The last public star party at the Satellite facility will be Sept 2nd. The Sept 30th and Oct 28th dates are tentatively scheduled to be held at the Garvey Ranch Park Observatory; see the map on page 12.

On Wednesday Nov 8th there is a transit of Mercury across the Sun from 11:15 am to 4:10 pm. Due to the uncertainty surrounding the re-opening of the Observatory, all that is certain is that Griffith is counting on support from the LAAS for this event. We’ll know more in the next month or two.

After October, nothing is certain because of the uncertainty surrounding the re-opening of Griffith Observatory. STAY TUNED.

Dave Nakamoto

A Tale of Two Dwarfs

By Tim Thompson

Our sun, like all main sequence stars, shines because it has a nuclear furnace in its core, a furnace that builds helium nuclei (2 protons & 2 neutrons) out of hydrogen nuclei (a proton). As time goes by, and hydrogen is fused into helium, the core will eventually no longer have enough hydrogen left to fuel the furnace. This will happen to our sun in a few billion years. The furnace in the core will go out, and a new

(Continued on page 4)
Editor's Message

The opening of Griffith is coming soon, tentatively by the end of the year, and this has caused changes to our public star party location and general meeting. SEE THE LAST PAGE OF THIS BULLETIN FOR THE LATEST NEWS.

A new member party will be held in September; contact Bob Redding at (310) 833-9221.

Please send all written correspondence, other than bulletin material, to:

LAAS
4800 Western Heritage Way
Los Angeles, CA  90027.

There will be one more change of address when Griffith Observatory re-opens.

The deadline for submitting bulletin material is the 10th of each month. Please submit electronically, if possible, to BulletinEditor@laas.org. All other material may be sent to the above address, but timely reception and publication cannot be guaranteed.

David Nakamoto

Important Announcements

We still need a Youth Liaison organizer. Please, if you’re interested in this position, contact one of the board members listed on this page.

Membership Annual Dues:
Year  $20.00
Regular (18-65)  $35.00
Senior Citizen (65 and up)  $20.00
Senior Family  $30.00
Family  $50.00
Group or Club  $50.00
Life  $500.00

Additional fees:
Charter Star member  $30.00
Star member, with pad  $70.00
Star member, no pad  $60.00

(Membership due date is indicated on the mailing label)

EVENTS CALENDAR

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location or Information</th>
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<tbody>
<tr>
<td>Sep 2nd (Sat)</td>
<td>Public Star Party</td>
<td>Griffith Observatory Satellite</td>
</tr>
<tr>
<td>Sep 11th (Mon)</td>
<td>General Meeting</td>
<td>Speaker TBD</td>
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<tr>
<td>Sep 16th (Sat)</td>
<td>New Member Party</td>
<td>Garvey Ranch Park</td>
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<tr>
<td>Sep 23rd (Sat)</td>
<td>Dark Sky Night</td>
<td>Lockwood Valley</td>
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<tr>
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<td>Public Star Party</td>
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<tr>
<td>Oct 9th (Mon)</td>
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<td>Dark Sky Night</td>
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<tr>
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<td>Public Star Party</td>
<td>Garvey Ranch Park</td>
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A reminder — The board meeting is held on the Wednesday night prior to the general meeting, at Garvey Ranch Park. It starts at 8:00 pm.
The Monday general meetings starts at 7:30 pm.

HANDY PHONE LIST

LAAS Answering Machine …… (213) 673-7355
Griffith Observatory
Program …………………………………………(323) 664-1191
Offices ……………………………………..(323) 664-1181
Sky Report …………………………………..(323) 663-8171
Lockwood Site …………………………….(661) 245-2106
Outgoing calls – collect or calling card
Mt. Wilson Institute …………………….(626) 793-3100

LAAS Home Page: http://www.laas.org
LAAS Bulletin Online: http://www.laas.org/bulletin.html
The summer triangle of Altair, Deneb, and Vega are high overhead in the evening. Soon Orion and Taurus will be poking their heads up in the eastern sky which heralds the approach of the fall and winter skies. Jupiter, the king of planets, is slowly slipping into the west but still puts on a good show. Check out one of the LAAS loaner telescopes and take advantage of the crisp winter nights.

LAAS-2 - 4.5” f/8 Tasco reflector on a motorized Edmund equatorial mount. This telescope has been upgraded with 1.25” accessories, a 6x30 finder, and very solid wooden legs. It comes fully equipped with a set of three Kellner eyepieces and a collimation tool.

LAAS-9 – 8” f/4.5 is available. It is on a Dobsonian mount and come equipped with a set of Plossl eyepieces. It has a Dob Driver II that, unfortunately, has problems, however the telescope itself is solid and gives good images. This short focus Newtonian is good for the Pleiades star cluster and Orion nebula that will be rising soon.

As can be seen from the previous short list of available telescopes there is only one left to be checked out at the present time. On the other hand several loaner telescopes are over due. These are LAAS 3, LAAS 5, and LAAS 6, and LAAS 7. LAAS 8, an 80mm refractor, should be coming back soon.

For further information concerning these loaner telescopes call: David Sovereign at (626) 794-0646.

As May once again draws to an end, it is, once again, time for the annual sojourn to the Land of Shaking Mountains and yet another gathering of Telescope Nuts, Amateur (and a few professional) astronomers, optical types, both theoretical and practical, tinkerers, serious hobbyists and professionals, the Riverside Telescope Makers Conference, so named from its origins at Riverside College, down in the basin. The conference (RTMC) outgrew its original venue and now meets, along with the Summer meeting of the Western Amateur Astronomers (WAA), at Camp Oakes, near Big Bear in the San Bernardino Mountains about 85 miles East of Los Angeles. Same old (tired?) introduction for the trip of 2006.

The trip into the sunset was essentially the same as most of the others, load up the telescope, photographic and cold weather gear, then out I-70 to Salina Utah and another dinner at Mom's Cafe. Difference, from last year, gas was about $0.80 more than last year, $3.10 at the highway exit, $2.91 in town and $2.83 around the corner. Again, a full tank and full belly, on to I-15 and Southwest through Vegas and my usual stop for the night at Halloran Summit, elevation
furnace will take its place, fusing hydrogen into helium in a shell around the core, which was once dominated by hydrogen, but will now be made mostly of helium. The helium core is hotter then the hydrogen core was, and it will get hotter still, as the helium “ash” from the new hydrogen furnace that surrounds it, rains down on the helium core, increasing its mass, making it shrink & heat up, under its own weight. This heating of the core, and migration of the furnace from the core to a shell surrounding the core, forces the outer layers of the star to expand enormously, the only way the star can remain stable and allow the super hot core to cool without blowing the star apart. This is how our sun will become a red giant, expanding from its current size, about 865,000 miles in diameter, up to a size about the same as Earth’s present orbit around the sun, about 186,000,000 miles in diameter. Finally, that helium core settles down to a long life as a white dwarf star, no bigger then Earth, and with no more active furnace. And the outer layers keep expanding, blowing away from the star altogether, and forming a planetary nebula. It is important to remember that the only way for a star to wind up as a white dwarf, is to go through the red giant stage.

So much for the big things, what about the little things? White dwarfs are not the only astronomical dwarfs out there. There is another kind of dwarf, the brown dwarf. Unlike the white dwarfs, the brown dwarfs don’t have any giant stage to go through. They start out as dwarfs, and they end up as dwarfs too. The trick with brown dwarfs is that they are objects that were never big enough to be a real star. Anything that is smaller than about 8% of the mass of the sun is too small for that hydrogen fusing furnace to ever start up. No furnace, no star. The most massive brown dwarf can be as much as 80 times the mass of Jupiter, but will be no bigger in diameter, because they are compressed by their own weight. Brown dwarfs and white dwarfs are about as different as they could be. The white dwarfs, although much more massive, is actually smaller in size. But while a brown dwarf might have a temperature around 2,000 Kelvins, a white dwarf will have a temperature as high as 100,000 Kelvins.

This extreme difference makes the discovery the binary system WD 0137-349 all the more interesting, because the two halves of this binary are a white dwarf and a brown dwarf. The discovery is reported by a group of English astronomers in the August 3, 2006 issue of the journal Nature, and in a press release on the webpage of the European Southern Observatory. The mass of the white dwarf, about 0.4 solar masses is notably lower than one would expect for a single white dwarf, about 0.6 solar masses. The mass of the companion, about 0.05 solar masses, is well below the 0.08 solar mass limit, and must be a brown dwarf. The brown dwarf orbits the white dwarf, with a “year” that is 116 minutes long, and at a distance of 0.65 solar radii, which means it is 331 times closer to the white dwarf, than Earth is to the sun. That’s very close. In fact, it is so close that there is only one explanation: The brown dwarf survived intact, despite being completely engulfed by the red giant star. That E-ticket ride also explains the unusually low mass for the white dwarf star. The brown dwarf, completely

(Continued on page 6)
Map to Monterey Park Observatory
(The place to build your telescope)

This figure shows a vertical stack of spectra made with the Ultraviolet-Visual Echelle Spectrograph (UVES) on the Kueyen telescope of the European Southern Observatory. The vertical axis is relative time in fractions of a day, and the horizontal axis is wavelength in nanometers on the bottom (multiply by 10 to get Angstrom units, divide by 1000 to get microns), and translated into Doppler shifted velocities on top (negative is towards us, positive is away). The dark vertical feature is hydrogen alpha absorption in the white dwarf atmosphere. The light curved feature is emission from the brown dwarf. The emission comes from the side of the brown dwarf that faces the white dwarf, and is heated by it. So the emission feature goes away when we look at the “night side” of the brown dwarf, and appears bright as we look at the “day side”. The twisting of the bright emission feature illustrates the observation of its orbit around the white dwarf, indicated by the slightly twisting absorption feature, as the two dwarfs orbit around their mutual center of gravity.

engulfed by the red giant, siphoned off much of the red giant’s outer envelope, ejecting most of it into space. The drag produced on the brown dwarf nearly sucked it too far in to survive, but not quite. Now, at least according to Einstein’s general relativity theory, the fast moving brown dwarf (it moves about 500,000 miles per hour in its orbit) will radiate gravitational waves, lose energy, and slowly spiral towards the white dwarf. In about 1.4 billion years, it will get so close that the white dwarf will begin to siphon material off the brown dwarf, and the binary will become a cataclysmic variable. There are already cataclysmic variables with periods as short as about 80 minutes, but until now, nobody was quite sure how they got that way. Now it appears that WD 0137-349 is the model for how it happens. There must have been other survivor brown dwarfs. 

This brown dwarf weighs in at about 50 Jupiter masses, or about 15,900 Earth masses. It’s big enough to barely survive being completely engulfed by the red giant. But Earth is much too small for that. As our own sun expands into a red giant, it will lose mass along the way, and in consequence, Earth will slowly spiral away from the expanding sun. Nobody knows who will win the race, Earth or sun. But if the sun does manage engulf Earth, our planet will not survive. But we do have considerably more than 1.4 billion years to wait. So, who knows, maybe 1.4 billion years from now, amateur astronomers will be looking at a new cataclysmic variable. And you saw it first, right here in the LAAS newsletter.

Constitutional Change

To LAAS Members,

The Board of Directors (BOD) has determined the need to update the Constitution in order to keep it up to date with the current practices of the LAAS. As per the rules in the Constitution, any changes to the document must be approved by a ¾ vote of the membership present at a general meeting. Notification of the proposed changes must also be sent out to the membership at least 30 days prior to the vote. As such, the BOD thinks it necessary to make the following changes to the LAAS Constitution:

Article 3: Membership

Section 1

Currently reads:

“There shall be eight (8) classes of membership in the society: Regular, Senior Citizen, Youth, Life, Star, Honorary, Honorary Life and Honorary Star Life.”

The BOD proposes to add to this section:

“There exists a sub-category of membership called Family. This adds a specific cost to the annual membership fee but permits all declared individuals residing within the same residence as the Head of Family (HOF) to be considered full members of the LAAS, with the exception that only one (1) copy of the LAAS monthly bulletin and Griffith Observer is sent to the family unit.”

Article 4: Officers

Section 3

Currently reads:

“No member shall be an officer who shall not have been a Regular or Senior Citizen member for at least one (1) year and who shall not be a member in good standing.”

The BOD proposes to change this to:

“No member shall be an officer who shall not have served on the LAAS Board of Directors (BOD) for at least one (1) year and who shall not be a member in good standing. This board service requirement of one year may be waived upon a majority vote by the BOD.”

These proposals will be voted on during the December 2006 General Meeting at the same time when the BOD and Officers are elected. The LAAS Constitution and By-Laws will be posted on the website shortly and are available upon request, and with proper lead time, in paper form to any LAAS member in good standing. If you have questions or comments about this, please email the LAAS Secretary at secretary@laas.org.
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Another 7. Sooo close. Saturday night it got really cold. After the door prizes it
was out to the 'scopes once more. It was very cold, the temperature getting down
to the lower 20s, and the seeing wasn't very good all so I hit the sack relatively
early. After quite a number of mild years I guess I became somewhat
complacent and didn't have all the Arctic survival gear I had in the past, but a
couple of layers, insulated coveralls and small plastic bottles of hot water made it
reasonably comfy. Sunday brought more papers, workshops and the Western
Amateur Astronomers (WAA) board meeting. There was a very interesting
paper by Anthony Stillman "Bronze Metal Mirrors", tracing the history of
mirrors from ancient times up to the large specula of Herschel and Rosse.
Anthony showed many of his attempts at fabricating Speculum metal and
processing it into telescope mirrors. At Sunday night's award presentations, the
WAA's prestigious G. Bruce Blair award for 2006 was given to John "Chris"
Butler, internationally renowned artist and public speaker, who is currently
Senior Art Director for planetarium and exhibit programs at the Griffith
Observatory in Los Angeles, my old alma mater. Very well deserved, indeed.
Sunday night was much more observer friendly, better seeing, no wind and
temperatures around freezing. Perhaps the best part of this get together was the
appearance of two more old friends, mentioned earlier, from the Mira Costa High
School Astronomy Club, from the 1950's, Mike Gardner and Pat Lowry, so there
was much more re-union-ish sorts of things. Stuart Hutchins and John Anderson
from Denver were there, John winning a merit award for his Solar Spectroscope
and Siderostat.

All too soon, it was over, time to pack up and slink away. My dear aunt Lisa had
passed away last fall, so there was no compelling reason to head down to the low
desert. Pat Lowry was staying in Big bear an extra night, probably a wise choice,
I can only imagine the traffic heading West on I-10 trying to get to Ontario
Airport. Remember this was the end of the Memorial Day weekend. I spent the
day with Pat, shooting 50 year's worth of bull and finally to dinner. I then headed
out, this time to the North, back down highway 18 to Lucerne Valley, and
basically retraced my route back to Denver. I was about 3 hours earlier than
usual, having left Big Bear around 6 or so, and being a much shorter trip than
down through Desert Hot Springs. Yes, inbound I-15 (toward L.A.) was tight
with a few jams all the way to Las Vegas. Pretty much the same drill as the other
trips, and before I knew it, I was sleeping in my own bed. A few more days of
R&R, then back to the old grind.

a: In the past, the expanding red giant completely swallowed the brown dwarf,
which accreted some of the star onto itself, but flung most of it off into space.
b: In the future, once they are close enough, the white dwarf's gravity will allow
it to strip material from the brown dwarf, and eventually finish the job of
consumption that the red giant failed to do. At that time the pair will be visible as
a short period, cataclysmic variable.

Image copyright Nature Publishing Group, 2006
From, A dwarf-eats-dwarf world, James Liebert, Nature 442: 520-521, August 3,
2006.
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Friday morning, it was off to Camp Oakes. I had some trepidation about finding a place to camp since it was the dark of the moon, which meant good dark sky conditions. There were rumors that more than 3000 folks would be attending this time. The biggest ones, a few decades ago, were like 2450. (More recent ones have averaged only about 1600 or so) so it might be a real crowd. Arriving at the camp about a half hour after the gate opened I was surprised to be able to go right on in, no line of traffic. A good sign. I was able to set up at my usual spot along Telescope Alley. (Attendance for this one was 1662) After I got my camp pitched, it was business as usual, hiking around meeting old friends, making new ones, drooling over more seriously sweet machinery and looking over the vendors sale items, the standard fare for Friday afternoon. After dinner, it was out to the telescopes. Observing conditions were supposed to be among the best, after all, it was New Moon, so that bright orb wouldn't be around to interfere with the observation/imaging of faint fuzzies. However, there were some high clouds, and the light pollution from the greater L. A. Basin, to the West and the desert cities to the Southeast was quite apparent. Later in the evening fierce winds began to blow. I was afraid I'd be making a call from Palm Springs for a ride back up the hill, but my tent stakes held and the telescope survived unscathed. Lumicon's tent, however, did blow away and the Yardscope (Astronomy-to-go's 36" Dob) was acting like a giant weathervane. The seeing, as we might expect, was awful, besides I couldn't keep the 'scope still and had to resort to low power just to keep Saturn in the field of view. The overnight temperature only went down to 52. Saturday morning brought the traditional swap meet. All sorts of interesting goodies. Again, I practiced unusual restraint and came back with only a little stuff. Concurrently there were the workshops and paper sessions. The theme for the 2006 get together was Dark Skies, with several papers on Light Pollution. The Robert Fulton Goff Invitational Lecture on Optics and Optical Design, in memory of Bob Goff, Optician extraordinary, was from John Gregory of Gregory Maksutov fame. An interesting tidbit is that John didn't invent the Maksutov, that, of course was Maksutov in Russia, but John figured out how this telescope worked, and was the first to publish his design. Apparently Maksutov didn't publish. John's talk was "My 60 Years of Astro Optics", Basically his involvement in the design of numerous lens systems for aerial photography, Astronomical wide field photography and essentially the history of the Perkin Elmer Corporation and their contributions to optics. All the wind of the previous night brought a cold front for Saturday, so it was still a bit blustery and cold. The Los Angeles Astronomical Society celebrated their 80th anniversary with a Luau. Very unluaulike weather, although I've experienced weather just like this, maybe even colder, in Hawaii-- On top of Mauna Kea. Nearly froze my keester off. A set of very interesting telescopes were brought by Ken Graun and Alan Binder, three co-mounted replicas of Galileo's telescopes. I was impressed by the tiny field of view of these things. I built a replica (optically) of a Keplerian refractor with an aperture of 3.6cm and a focal length of 2 meters and a magnification of about 55X. It's tough enough to point and keep pointed at an object, although the long tube helps. The Galileans had fields of only a few arc minutes at magnifications around 20X to 25X. I can only imagine trying to locate objects with these instruments. Meade unveiled their "Monster Mount" and Ritchey Chrétien telescope combination. Competition for Paramount, perhaps. Saturday night the keynote speech was an outstanding presentation by Mike Brown of Caltech "Beyond Pluto: Discovery of the 10th Planet" Referring to 2003-UB313, which is thought to be slightly larger than Pluto. This, of course brought up the debate about "what is a planet?", Dethroning Pluto and all. I don't recall who said it to me, but I agree with it. "The Solar System has eight planets, 1000's of chunks of debris and one Planet Emeritus". Recalling last year's keynote lecture, "Palomar's 200-inch Telescope: The Impossible Challenge", Todd and Robin Mason's documentary, "Journey to Palomar" was aired in Los Angeles as a fundraiser to get it on Public Television. After Mike Brown's talk there was the
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reasonably comfy. Sunday brought more papers, workshops and the Western
Amateur Astronomers (WAA) board meeting. There was a very interesting
paper by Anthony Stillman "Bronze Metal Mirrors", tracing the history of
mirrors from ancient times up to the large specula of Herschel and Rosse.
Anthony showed many of his attempts at fabricating Speculum metal and
processing it into telescope mirrors. At Sunday night's award presentations, the
WAA's prestigious G. Bruce Blair award for 2006 was given to John "Chris"
Butler, internationally renowned artist and public speaker, who is currently
Senior Art Director for planetarium and exhibit programs at the Griffith
Observatory in Los Angeles, my old alma mater. Very well deserved, indeed.
Sunday night was much more observer friendly, better seeing, no wind and
temperatures around freezing. Perhaps the best part of this get together was the
appearance of two more old friends, mentioned earlier, from the Mira Costa High
School Astronomy Club, from the 1950's, Mike Gardner and Pat Lowry, so there
was much more re-union-ish sorts of things. Stuart Hutchins and John Anderson
from Denver were there, John winning a merit award for his Solar Spectroscope
and Siderostat.

All too soon, it was over, time to pack up and slink away. My dear aunt Lisa had
passed away last fall, so there was no compelling reason to head down to the low
desert. Pat Lowry was staying in Big Bear an extra night, probably a wise choice,
I can only imagine the traffic heading West on I-10 trying to get to Ontario
Airport. Remember this was the end of the Memorial Day weekend. I spent the
day with Pat, shooting 50 year's worth of bull and finally to dinner. I then headed
out, this time to the North, back down highway 18 to Lucerne Valley, and
basically retraced my route back to Denver. I was about 3 hours earlier than
usual, having left Big Bear around 6 or so, and being a much shorter trip than
down through Desert Hot Springs. Yes, inbound I-15 (toward L.A.) was tight
with a few jams all the way to Las Vegas. Pretty much the same drill as the other
trips, and before I knew it, I was sleeping in my own bed. A few more days of
R&R, then back to the old grind. ✤

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**Image copyright Nature Publishing Group, 2006**
From, *A dwarf-eats-dwarf world*, James Liebert, Nature 442: 520-521, August 3,
2006.

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**a**: In the past, the expanding red giant completely swallowed the brown dwarf,
which accreted some of the star onto itself, but flung most of it off into space.

**b**: In the future, once they are close enough, the white dwarf's gravity will allow
it to strip material from the brown dwarf, and eventually finish the job of
consumption that the red giant failed to do. At that time the pair will be visible as
a short period, cataclysmic variable.
engulfed by the red giant, siphoned off much of the red giant’s outer envelope, ejecting most of it into space. The drag produced on the brown dwarf nearly sucked it too far in to survive, but not quite. Now, at least according to Einstein’s general relativity theory, the fast moving brown dwarf (it moves about 500,000 miles per hour in its orbit) will radiate gravitational waves, lose energy, and slowly spiral towards the white dwarf. In about 1.4 billion years, it will get so close that the white dwarf will begin to siphon material off the brown dwarf, and the binary will become a cataclysmic variable. There are already cataclysmic variables with periods as short as about 80 minutes, but until now, nobody was quite sure how they got that way. Now it appears that WD 0137-349 is the model for how it happens. There must have been other survivor brown dwarfs.

This brown dwarf weighs in at about 50 Jupiter masses, or about 15,900 Earth masses. It’s big enough to barely survive being completely engulfed by the red giant. But Earth is much too small for that. As our own sun expands into a red giant, it will lose mass along the way, and in consequence, Earth will slowly spiral away from the expanding sun. Nobody knows who will win the race, Earth or sun. But if the sun does manage engulf Earth, our planet will not survive. But we do have considerably more than 1.4 billion years to wait. So, who knows, maybe 1.4 billion years from now, amateur astronomers will be looking at a new cataclysmic variable. And you saw it first, right here in the LAAS newsletter.

Constitutional Change

To LAAS Members,

The Board of Directors (BOD) has determined the need to update the Constitution in order to keep it up to date with the current practices of the LAAS. As per the rules in the Constitution, any changes to the document must be approved by a ¾ vote of the membership present at a general meeting. Notification of the proposed changes must also be sent out to the membership at least 30 days prior to the vote. As such, the BOD thinks it necessary to make the following changes to the LAAS Constitution:

Article 3: Membership

Section 1

Currently reads:

“There shall be eight (8) classes of membership in the society: Regular, Senior Citizen, Youth, Life, Star, Honorary, Honorary Life and Honorary Star Life.”

The BOD proposes to add to this section:

“There exists a sub-category of membership called Family. This adds a specific cost to the annual membership fee but permits all declared individuals residing within the same residence as the Head of Family (HOF) to be considered full members of the LAAS, with the exception that only one (1) copy of the LAAS monthly bulletin and Griffith Observer is sent to the family unit.”

Article 4: Officers

Section 3

Currently reads:

“No member shall be an officer who shall not have been a Regular or Senior Citizen member for at least one (1) year and who shall not be a member in good standing.”

The BOD proposes to change this to:

“No member shall be an officer who shall not have been a Regular or Senior Citizen member for at least one (1) year and who shall not be a member in good standing.”

The BOD proposes to change this to:

“No member shall be an officer who shall not have served on the LAAS Board of Directors (BOD) for at least one (1) year and who shall not be a member in good standing. This board service requirement of one year may be waived upon a majority vote by the BOD.”

These proposals will be voted on during the December 2006 General Meeting at the same time when the BOD and Officers are elected. The LAAS Constitution and By-Laws will be posted on the website shortly and are available upon request, and with proper lead time, in paper form to any LAAS member in good standing. If you have questions or comments about this, please email the LAAS Secretary at secretary@laas.org.
Map to Monterey Park Observatory

(The place to build your telescope)

This figure shows a vertical stack of spectra made with the Ultraviolet-Visual Echelle Spectrograph (UVES) on the Kueyen telescope of the European Southern Observatory. The vertical axis is relative time in fractions of a day, and the horizontal axis is wavelength in nanometers on the bottom (multiply by 10 to get Angstrom units, divide by 1000 to get microns), and translated into Doppler shifted velocities on top (negative is towards us, positive is away). The dark vertical feature is hydrogen alpha absorption in the white dwarf atmosphere. The light curved feature is emission from the brown dwarf. The emission comes from the side of the brown dwarf that faces the white dwarf, and is heated by it. So the emission feature goes away when we look at the “night side” of the brown dwarf, and appears bright as we look at the “day side”. The twisting of the bright emission feature illustrates the observation of its orbit around the white dwarf, indicated by the slightly twisting absorption feature, as the two dwarfs orbit around their mutual center of gravity.

furnace will take its place, fusing hydrogen into helium in a shell around the core, which was once dominated by hydrogen, but will now be made mostly of helium. The helium core is hotter than the hydrogen core was, and it will get hotter still, as the helium “ash” from the new hydrogen furnace that surrounds it, rains down on the helium core, increasing its mass, making it shrink & heat up, under its own weight. This heating of the core, and migration of the furnace from the core to a shell surrounding the core, forces the outer layers of the star to expand enormously, the only way the star can remain stable and allow the super hot core to cool without blowing the star apart. This is how our sun will become a red giant, expanding from its current size, about 865,000 miles in diameter, up to a size about the same as Earth’s present orbit around the sun, about 186,000,000 miles in diameter. Finally, that helium core settles down to a long life as a white dwarf star, no bigger than Earth, and with no more active furnace. And the outer layers keep expanding, blowing away from the star altogether, and forming a planetary nebula. It is important to remember that the only way for a star to wind up as a white dwarf, is to go through the red giant stage.

So much for the big things, what about the little things? White dwarfs are not the only astronomical dwarfs out there. There is another kind of dwarf, the brown dwarf. Unlike the white dwarfs, the brown dwarfs don’t have an giant stage to go through. They start out as dwarfs, and they end up as dwarfs too. The trick with brown dwarfs is that they are objects that were never big enough to be a real star. Anything that is smaller than about 8% of the mass of the sun is too small for that hydrogen fusing furnace to ever start up. No furnace, no star. The most massive brown dwarf can be as much as 80 times the mass of Jupiter, but will be no bigger in diameter, because they are compressed by their own weight. Brown dwarfs and white dwarfs are about as different as they could be. The white dwarfs, although much more massive, is actually smaller in size. But while a brown dwarf might have a temperature around 2,000 Kelvins, a white dwarf will have a temperature as high as 100,000 Kelvins.

This extreme difference makes the discovery the binary system WD 0137-349 all the more interesting, because the two halves of this binary are a white dwarf and a brown dwarf. The discovery is reported by a group of English astronomers in the August 3, 2006 issue of the journal *Nature*, and in a press release on the webpage of the European Southern Observatory. The mass of the white dwarf, about 0.4 solar masses is notably lower than one would expect for a single white dwarf, about 0.6 solar masses. The mass of the companion, about 0.05 solar masses, is well below the 0.08 solar mass limit, and must be a brown dwarf. The brown dwarf orbits the white dwarf, with a “year” that is 116 minutes long, and at a distance of 0.65 solar radii, which means it is 331 times closer to the white dwarf, than Earth is to the sun. That’s very close. In fact, it is so close that there is only one explanation: *The brown dwarf survived intact, despite being completely engulfed by the red giant star*. That E-ticket ride also explains the unusually low mass for the white dwarf star. The brown dwarf, completely

**Mt Wilson 60” Nights**

The Mount Wilson 60” nights are back! The dates for the nights are as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>Sep 1st</td>
<td>Half nighter, also 1st quarter moon, limiting the targets.</td>
</tr>
</tbody>
</table>

Only LAAS members are allowed to sign up. If there is still room two (2) weeks prior to the date, paying guests will be permitted. Be sure to let Darrell Dooley know the names of your guests as he is keeping a waiting list. (First Come, First Serve)

Any LAAS member who has not been to a 60 inch night at Mount Wilson should consider it as an opportunity to visit astronomy history. To see the location and equipment used by giants such as Wilson and Hubble, will add to your appreciation of their contributions. It should be understood that the scope belongs to LAAS only half the night. We mutually agree upon which objects to view. Often, a member is the operator, so it is a very comfortable environment. (Do bring a coat, however) The viewing is without a doubt the best your are likely to see in your lifetime. We already have reservations for that night, so don't delay and miss a unique opportunity to socialize with other members and view objects you only see in publications.

Send your check payable to LAAS, for $60 per person per night, $35 for the Sept 1st night, to Darrell Dooley, 1815 Avalon Street, Los Angeles 90026. You can also email treasurer@laas.org to let him know that your check is in the mail. Please specify the names of attendees. ✪

(Continued on page 6)
The summer triangle of Altair, Deneb, and Vega are high overhead in the evening. Soon Orion and Taurus will be poking their heads up in the eastern sky which heralds the approach of the fall and winter skies. Jupiter, the king of planets, is slowly slipping into the west but still puts on a good show. Check out one of the LAAS loaner telescopes and take advantage of the crisp winter nights.

LAAS-2 - 4.5" f/8 Tasco reflector on a motorized Edmund equatorial mount. This telescope has been upgraded with 1.25" accessories, a 6x30 finder, and very solid wooden legs. It comes fully equipped with a set of three Kellner eyepieces and a collimation tool.

LAAS-9 – 8" f/4.5 is available. It is on a Dobsonian mount and come equipped with a set of Plossl eyepieces. It has a Dob Driver II that, unfortunately, has problems, however the telescope itself is solid and gives good images. This short focus Newtonian is good for the Pleiades star cluster and Orion nebula that will be rising soon.

As can be seen from the previous short list of available telescopes there is only one left to be checked out at the present time. On the other hand several loaner telescopes are over due. These are LAAS 3, LAAS 5, and LAAS 6, and LAAS 7. LAAS 8, an 80mm refractor, should be coming back soon.

For further information concerning these loaner telescopes call: David Sovereign at (626) 794-0646.

President’s Message

Dave Sovereign

The next function on the LAAS calendar will be the new member pot luck and star party to be held at the Monterey Park facility. It has been re-scheduled for September, which may be late this year, but it is always well attended. Negotiations are continuing that would create an observing area in the north San Fernando Valley that could be used by the LAAS. The LAAS has been growing over the last few months. At the last board meeting about 16 new members, including several families, were voted in. We welcome these new members to the Society. Good Seeing and we hope to see you at the new member pot luck.

RTMC Trip Report, 2006

By Jack Eastman

(Reprinted with his permission from his email communication)

As May once again draws to an end, it is, once again, time for the annual sojourn to the Land of Shaking Mountains and yet another gathering of Telescope Nuts, Amateur (and a few professional) astronomers, optical types, both theoretical and practical, tinkerers, serious hobbyists and professionals, the Riverside Telescope Makers Conference, so named from its origins at Riverside College, down in the basin. The conference (RTMC) outgrew its original venue and now meets, along with the Summer meeting of the Western Amateur Astronomers (WAA), at Camp Oakes, near Big Bear in the San Bernardino Mountains about 85 miles East of Los Angeles. Same old (tired?) introduction for the trip of 2006.

The trip into the sunset was essentially the same as most of the others, load up the telescope, photographic and cold weather gear, then out I-70 to Salina Utah and another dinner at Mom's Cafe. Difference, from last year, gas was about $0.80 more than last year, $3.10 at the highway exit, $2.91 in town and $2.83 around the corner. Again, a full tank and full belly, on to I-15 and Southwest through Vegas and my usual stop for the night at Halloran Summit, elevation

(Continued on page 8)
Editor’s Message

The opening of Griffith is coming soon, tentatively by the end of the year, and this has caused changes to our public star party location and general meeting. SEE THE LAST PAGE OF THIS BULLETIN FOR THE LATEST NEWS.

A new member party will be held in September; contact Bob Redding at (310) 833-9221.

Please send all written correspondence, other than bulletin material, to:

LAAS
4800 Western Heritage Way
Los Angeles, CA  90027.

There will be one more change of address when Griffith Observatory re-opens.

The deadline for submitting bulletin material is the 10th of each month. Please submit electronically, if possible, to BulletinEditor@laas.org. All other material may be sent to the above address, but timely reception and publication cannot be guaranteed.

David Nakamoto

Important Announcements

We still need a Youth Liaison organizer. Please, if you’re interested in this position, contact one of the board members listed on this page.

Membership Annual Dues:
- Youth: $20.00
- Regular (18-65): $35.00
- Senior Citizen (65 and up): $20.00
- Senior Family: $30.00
- Family: $50.00
- Group or Club: $50.00
- Life: $500.00

Additional fees:
- Charter Star member: $30.00
- Star member, with pad: $70.00
- Star member, no pad: $60.00

(Membership due date is indicated on the mailing label)

HANDY PHONE LIST

LAAS Answering Machine: (213) 673-7355
Griffith Observatory Program: (213) 664-1191
Offices: (213) 664-1181
Sky Report: (213) 663-8171
Lockwood Site: (661) 245-2106
Mt. Wilson Institute: (626) 793-3100

LAAS Home Page: http://www.laas.org
LAAS Bulletin Online: http://www.laas.org/bulletin.html

EVENTS CALENDAR

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<th>Event</th>
<th>Location or Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 2nd (Sat)</td>
<td>Public Star Party</td>
<td>Griffith Observatory Satellite</td>
</tr>
<tr>
<td>Sep 11th (Mon)</td>
<td>General Meeting</td>
<td>Speaker TBD</td>
</tr>
<tr>
<td>Sep 16th (Sat)</td>
<td>New Member Party</td>
<td>Garvey Ranch Park</td>
</tr>
<tr>
<td>Sep 23rd (Sat)</td>
<td>Dark Sky Night</td>
<td>Lockwood Valley</td>
</tr>
<tr>
<td>Sep 30th (Sat)</td>
<td>Public Star Party</td>
<td>Garvey Ranch Park</td>
</tr>
<tr>
<td>Oct 9th (Mon)</td>
<td>General Meeting</td>
<td>Speaker TBD</td>
</tr>
<tr>
<td>Oct 21st (Sat)</td>
<td>Dark Sky Night</td>
<td>Lockwood Valley</td>
</tr>
<tr>
<td>Oct 28th (Sat)</td>
<td>Public Star Party</td>
<td>Garvey Ranch Park</td>
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A reminder — The board meeting is held on the Wednesday night prior to the general meeting, at Garvey Ranch Park. It starts at 8:00 pm. The Monday general meetings starts at 7:30 pm.
ATTENTION LOCATION CHANGES

Due to the upcoming re-opening of Griffith Observatory, the following changes have been made to the following venues:

The September and October General Meetings will be held at the Griffith Observatory Satellite, but there is a possibility that they won’t be held in the Planetarium, but in the Administrative trailer to the South and East of the Planetarium trailer (to the right and behind if you’re facing the front of that trailer).

The last public star party at the Satellite facility will be Sept 2nd. The Sept 30th and Oct 28th dates are tentatively scheduled to be held at the Garvey Ranch Park Observatory; see the map on page 12.

On Wednesday Nov 8th there is a transit of Mercury across the Sun from 11:15 am to 4:10 pm. Due to the uncertainty surrounding the re-opening of the Observatory, all that is certain is that Griffith is counting on support from the LAAS for this event. We’ll know more in the next month or two.

After October, nothing is certain because of the uncertainty surrounding the re-opening of Griffith Observatory. STAY TUNED.

Dave Nakamoto

A Tale of Two Dwarfs

By Tim Thompson

Our sun, like all main sequence stars, shines because it has a nuclear furnace in its core, a furnace that builds helium nuclei (2 protons & 2 neutrons) out of hydrogen nuclei (a proton). As time goes by, and hydrogen is fused into helium, the core will eventually no longer have enough hydrogen left to fuel the furnace. This will happen to our sun in a few billion years. The furnace in the core will go out, and a new

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Notes, corrections, questions, ideas, articles? All are welcome at: BulletinEditor@laas.org.