



Newsletter of the Pomona Valley Amateur Astronomers

Volume 32 Number 08

nightwatch

August 2012

President's Message

In most of my presidential messages I try to say something about observing, but this one will be strictly housekeeping.

Probably the most important issue has to do with the club calendar, relating to elections and dues. Traditionally these things have been taken care of in August. This is inconvenient, for reasons I'll explain.

Our national umbrella organization is the Astronomical League. Everyone who joins the PVAA is therefore also a member of the AL, and should be receiving *The Reflector*, which is the league's quarterly newsletter (if you're not getting it, contact the AL and let them know, or let me know and I'll pass the word along). We aren't in the Astronomical League just for the newsletter, of course. The most important benefit they provide us is liability insurance coverage for our star parties and public outreaches. Without that coverage, we couldn't afford to set up telescopes for the public—one person who tripped over a tripod could sue us into oblivion. So it's important that we remain in good standing with the AL. Our dues to them are due on July 1, usually a couple of months before our own membership renewal in mid- or late August. As a result, we're never sure how much money to send, and sometimes end up overpaying to be on the safe side.

The AL isn't going to change its schedule anytime soon, but we could fix this on our own by making our "club year" run from May to April instead of September to August. So we're going to collect dues and hold elections as usual in the next two months, but then—with the club's approval—we'd like to switch over to the May-to-April schedule next spring. Now, we don't want to cheat anyone out of their full year of membership, so if the proposed plan is approved, anyone who paid full dues this fall will get a discount on next year's dues come May. We'd like to have dues due in May because it usually takes a couple of months for everyone to get them in, and this gives us a little

padding before we have to send off our Astronomical League dues at the end of June. Also, collecting full dues now and prorated dues later means we haven't screwed up the club's finances if the calendar change isn't approved!

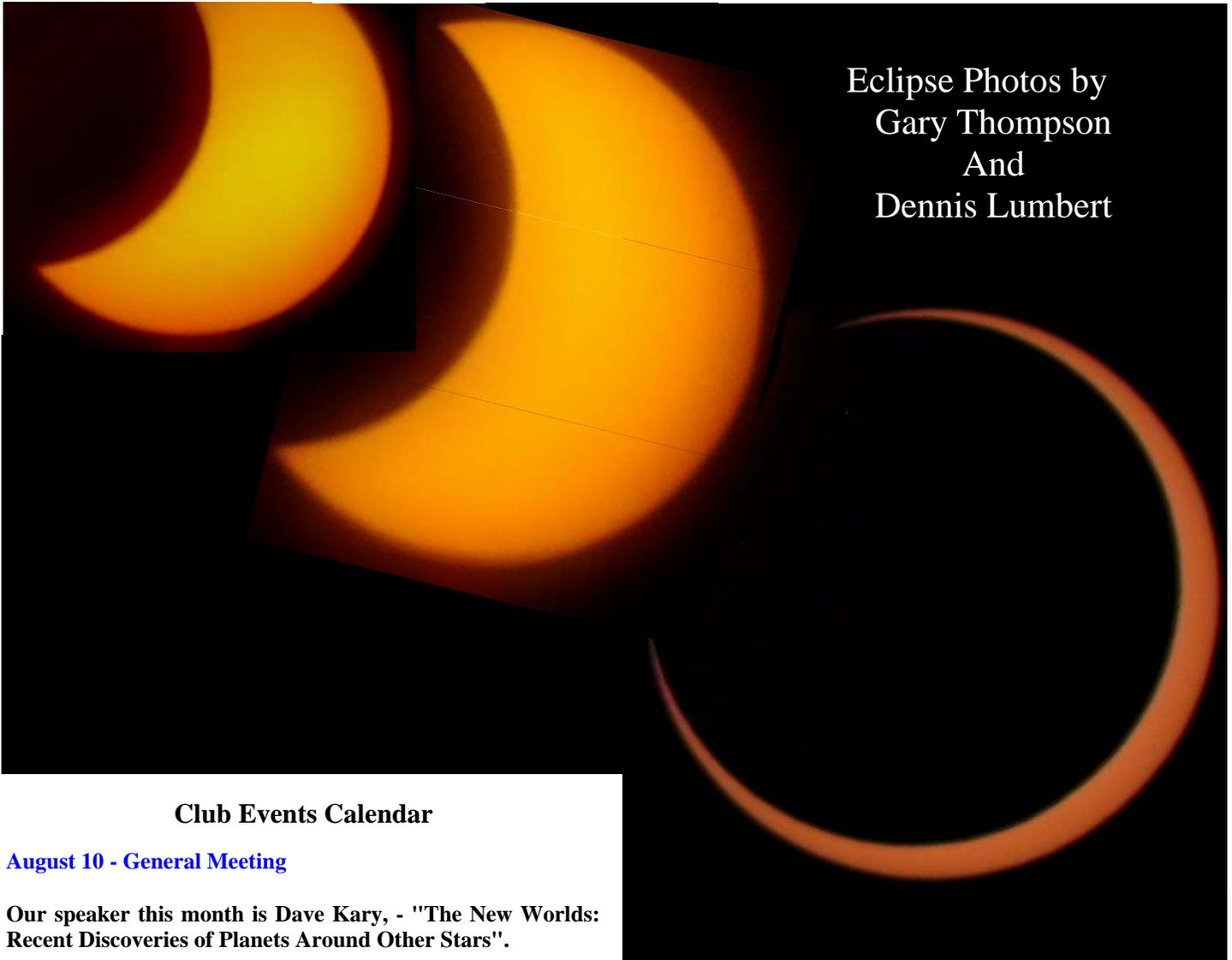
In other news, the library telescope program is going great. Library checkouts are confidential, but a little bird told me that even the mayor of Claremont is on the waiting list to check out the scope. That waiting list is 23 weeks long, so if you're interested in borrowing a scope sooner, ask me or one of the other club officers about borrowing one of the club's loaner scopes. We have 8", 10", and 12" dobsonian-mounted reflectors available for check-out to members.

Finally, elections are coming up and we need officers. We're still without an outreach coordinator and other offices will need filling as well. It's not a huge amount of work, but it is necessary work to keep the club functioning, and I encourage you to get involved.

Matt Wedel

Summer is Election Season for PVAA

At our July 13th general meeting nominations for PVAA board positions and club offices will be accepted. Be thinking of who you might want to nominate. All of our current board members have consented to run again. Of course, you can nominate anyone who is a current member. The elections will be held at our August 10th general meeting. Please try to attend both meetings if you can.



Eclipse Photos by
Gary Thompson
And
Dennis Lumbert

Club Events Calendar

August 10 - General Meeting

Our speaker this month is Dave Kary, - "The New Worlds: Recent Discoveries of Planets Around Other Stars".

August 18 - Star Party - Mojave River Forks Regional Park
August 30 - Board Meeting, 6:15

September 7 - General Meeting

September 15 - Star Party - To Be Announced
September 20-21 - PATS Astro Imaging Workshop
September 22-23 - PATS
September 27 - Board Meeting, 6:15

October 5 - General Meeting

October 13-Star Party–Nightfall/Anza-Borrego Desert State Park
October 23 – Ontario Library Main Branch 7 – 9pm
October 25 - Board Meeting, 6:15

November 2 - General Meeting

November 10 - Star Party - To Be Announced
November 30 - Board Meeting, 6:15

December 7 – PVAA Holiday Party

December 27 – Board Meeting, 6:15

PVAA Officers and Board

Officers

PresidentMathew Wedel909-767-9851
Vice President ..Joe Hillberg.....909/949-3650
SecretaryBill Connelly.....714/329-4080
TreasurerGary Thompson.....909/935-5509
VP FacilitiesJeff Felton.....

Board

Bill Vaskis (2013).....
Lee Collins (2012).....626/852-9442
Ray Magdziarz (2012).....909/626-8303
Karl Rijkse (2013).....

Directors

NightwatchJohn Stover.....909/988-9747
Membership ...Ludd Trozpek.....909/624-3679
ProgramsRon Hoekwater.....909/391-1943
PublicityLaura Jaoui.....

How Does It Work?

The discovery of what is likely to be the Higgs Boson has been celebrated in the news but little is said about why it is so important nor what it actually explains.

In the late 1950's and early 1960's particle physics was deriving the equations from quantum mechanics to explain the properties of elementary particles. The Standard Model was being developed. New particles were being discovered while pairs of old particles were proven to be the same.

In quantum theory the particles are described by wave functions that extend to infinity. The nature of a given particle was expected to result from the integration of the expression if the wave function was correct. It worked fine for photons.

But when mass like particles were described the integration caused the solution to "blow up." That is to say it was like dividing by zero. Along came an idea that if another expression were in the denominator and it was integrated like the numerator, the equation would converge. That is to say the result would be finite and real.

Higgs suggested an expression that did that and suggested that it might describe a boson that interacts with a field in such a way as to provide inertia – the primary property of mass. Without much explanation, the idea was that there was a field which would resist this particle if it tried to change velocity.

Keep in mind that General Relativity tells us that mass and energy can be equated – $E = mc^2$. But there was little to explain just what that meant. We had photons which we said were pure energy, no mass. And we had particles which had mass. We started to assign the equivalent energy to particles instead of the apparent mass.

The math worked then and has continued to work. It describes what we observe. But no one had detected a Higgs particle until this year. Some thought it should have higher energy. Some thought it would have a lower energy. But at the LHC a small bump in the data at 125 GeV popped up.

Determined not to make the same mistake as was done with the "faster than light neutrinos," the two teams held back their excitement until the data had been checked and re-checked. It had to show up in multiple runs. It had to be "found" by two independent teams looking at the data. It had to appear often enough to eliminate the possibility of noise. But the bump did persist and the announcement could be made. This is "very probably" the Higgs Boson that has been sought for the past 45 years.

But that doesn't "close the book" on a cold case file. It opens a whole new book. Now the theorists can assign an energy to the particle. Speculation as to its energy is removed. Now we can focus on the Higgs field and what it is like.

The most energetic photons still travel at the speed of light. But at the top of the spectrum we see energies similar to those of a neutrino. Does the Higgs attach to a photon to form a neutrino? There are three "flavors" of neutrinos. One type can become another in mid flight. That means they change apparent characteristic energies. Is this the Higgs interacting in some way?

When a star burns its fuel, more energy is carried into space by neutrinos than by photons. How will knowing the energy of the Higgs affect our model of star burn out? Will confidence in a

July General Meeting

President Matt Wedel opened the meeting and club secretary Bill Connelly presented the club calendar. Tickets for the Pacific Astronomy and Telescope Show (PATS) are available from Ron Hoekwater for \$15.00. That is a \$5.00 savings. PATS is held at the Pasadena Convention Center. This year it will be on September 22nd & 23rd.

We now have loaner scopes available to club members. We have an 8 inch Dob, a 10 inch Dob and a 12 inch Dob available to be loaned out. Bill brought the 8 inch Dob to the meeting, and it was immediately "checked out" by member Jason Balderrama.

The club received a book donation from Mike Kinnon - "The Telescope Handbook and Star Atlas"

Craig Matthews earned the Astronomical League Outreach Award. PVAA President Matt Wedel proudly signed and presented it to him, with the club giving him a hardy round of applause.

After the break several members showed their pictures of the May 20th solar eclipse and the June 5th solar transit of Venus, among other things.

Gary Gonnella was part of Google's "Virtual Star Party". You can see it at

<https://plus.google.com/110701307803962595019/posts/iTqtTnmjLw#110701307803962595019/posts/iTqtTnmjLw>

The Google Team spent all day at Gary Gonnella's house as they set up and checked out his equipment.

Joe Hillberg went to Blackrock Pass on Hwy 6 in Nevada for the solar eclipse, and back to Nevada for the Venus transit.

Shawn Griffin showed several shots he took of the Venus transit in Upland using the projection method.

Gary Thompson showed several photos using his hand held cell phone through a 4.5" Celestron reflector with a solar filter over the telescope opening.

Matt Wedel used his Astroscan telescope with projection in Arizona for the Venus transit. His hotel provided solar filter glasses. He showed about 85 people the Venus transit, including 65 – 70 from Switzerland.

Lauri Jaoui showed her pictures from Mount Wilson for the Venus transit. There were several unique setups, and all had a good time. The Discovery Channel was there. You should see something about it soon on cable.

Ron Hoekwater took a slightly different approach and showed pictures of the town of Caliente Nevada. He was there during the solar eclipse on May 20th. He was also at Mount Wilson during the Venus Transit.

Everyone liked the presentations, and there is talk of making this an annual event.

Gary Thompson

Higgs field shed new light on General Relativity? Does Dark Matter also rely on a Higgs Boson? Is Dark Energy related to the Higgs field? The questions are endless.

A theory has worked for nearly 50 years without confirmation. It was considered probably reliable. But to confirm that theory was elusive. Exciting times lie ahead as we assign values to the equations and can make more reliable models.

Ken Crowder

What's Up? - Illusive Martians

Curiosity's successful landing Mars will continue the search for illusive Martian life. It's the seventh successful landing following Viking 1 & 2, Pathfinder, Opportunity, Spirit, and Phoenix. Opportunity still works, so now we have two working surface probes.

But let's look back at the history of the illusive Martians. Early observers cheerfully assumed that nearby Mars had Earthlike life. In 1879, astronomer Giovanni Schiaparelli published one of the first highly detailed maps of Mars. On it were lines he felt were water channels. Being Italian, "canali" is what he called them. Water meant Martian life.

It was wealthy Percival Lowell, in his own observatory in the mountains of Arizona, who wrote in *Mars* (1896) that these canals were the work of intelligent Martians moving water from the poles to irrigate their dry planet. Rumor had it that every time his father demanded that he return to run the family textile mills Percival saw a new canal being built by industrious Martians. No other astronomers saw Lowell's canals but science fiction writers and the popular press loved them.

H. G. Wells (inspired by Lowell) wrote *War Of The Worlds* (1889) in which thirsty Martians invade Earth for its water. In 1938 Orson Welles dramatized it on radio (on Halloween) and frightened listeners believed Martians were actually invading. Often Martians were a dying race as in Ray Bradbury's *Martian Chronicles* (1950). Arnold Schwarzenegger uncovered a lost Martian civilization in the movie *Total Recall* (1990). The recent film *John Carter* is based on Edgar Rice Burroughs' 1917 stories of warlike Martians.

This mythology of Martian life was so established that the first barren looking pictures of Mars taken by Mariner probes in the 1960's were a real disappointment. But then pictures of enormous canyons eroded along lines of seismic faults and dry river beds gave some truth to the legendary canals. Water had once flowed on Mars and settled into shallow lakes. But how many billions of years ago had it happened? The Viking Lander program produced evidence that large amounts of water still remained frozen below the surface and at the poles combined with carbon dioxide (dry ice). Sadly there was no evidence of even microbial life in the soil. Where were the illusive Martians?

A photographed hill that looked rather like a human face reawakened the believers in the lost Martians. The government was covering up evidence of Martian life! The failure of over half the Mars missions proved that hidden Martians were sabotaging them. In 1996 a Martian meteorite from Antarctica seemed to show a wormlike microscopic fossil from Mars. There was still hope if only the government would tell the truth.

Sadly, nothing has been uncovered to indicate that Mars every had life. The Opportunity rover proved that shallow lakes stood for long enough to form accretion sediments. It also

showed these lakes to have been too salty for life as we know it. The lakes formed billions of years ago when river channels were formed by flowing water perhaps volcanically melted from the interior. The atmosphere must have been thickened by those volcanic eruptions. But such clouds would have been full of toxic sulfur.

Mars is only half the size of Earth making its atmosphere very thin today. It's air pressure is so low that liquid water can't exist on the surface.

Phoenix set down in the polar regions where expanses of frosty carbon dioxide (dry ice) protect water ice beneath. It reached down and uncovered white water ice. It was water that evaporated hours after being exposed to low atmospheric pressure. Any microscopic organism would have to exist in wet soil dozens of feet below the surface to survive. The Martian surface itself is constantly bombarded by deadly cosmic rays. Mars has no magnetic field or atmosphere thick enough to protect itself from hostile radiation.



Mars orbiting probes have photographed gullies on the sides of craters where what could be liquid water flows out only to quickly freeze and evaporate. Otherwise the only thing seen moving on the surface are dust devils. These ghostly forms have been photographed as they spin about (pictured). Because of the thin atmosphere some devils are over 30,000 feet high. Wings generated by Martian seasons create great dust storms that can obscure the entire planet. When I was a kid the seasonal darkening and lightening of areas was hopefully thought to be the growing cycle of a simple Martian plant form. But it was just the winds shifting the talcum powder thin orange red dust in seasonal patterns.

Today, solid scientific evidence that life has ever existed on Mars, even in a wet period eons ago, is as shifty and furtive as these dust devils.

Lee Collins