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***DRYWASHER'S GAZETTE MAR 2006***

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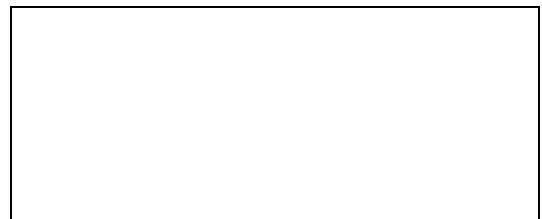
Send Exchange Bulletins to:

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**Next General Meeting**

**March 30, 2006 @ 7:00 p.m.**

**Last Thursday of Each Month**

**Knights of Columbus Hall**

**1729 E. Baseline Road**

**San Bernardino, CA**

**We're on the WEB**

**<http://geocities.com/valleyprospectors>**



**President by election next general meeting**

- Vice President John Howell .....951.247.1037
- Secretary Steve Schubert.....951.943.0535
- Treasurer Pat LaRue.....909.874.5664

**Board of Directors**

- Kent Bryant.....909.982.6776
- Mario Capote..... 909.338.6690
- Dan Cornia.....909.797.6111
- Bill Gunderson.....909.948.2029
- Charlene Gunderson.....909.948.2029
- Jack Hunt.....951.654.1043
- Bural LaRue.....909.874.5664
- Celina Hunt.....951.654.1043
- Susan Templeton.....909.289.9265
- Travis Templeton.....909.289.9265
- Phil Thomas.....951.369.8658
- Mary Mary Valdez.....951.369.8658

**Alternate Board Members**

- Open Position.....
- Edna Wade.....909.883.2198
- Terry Wade.....909.883.2198

**Committee Chairpersons**

- Apparel.....Susan + Travis Templeton..909.289.9265
- Blood Bank...Mary Schubert.....951.943.0535
- Budget.....Pat LaRue.....909.874.5664
- CFMSDir.....Bural LaRue.....909.874.5664
- Claims.....John Howell.....951.247.1037
- Courtesy.....Jack + Celina Hunt.....951.654.1043
- Editor.....Cornel Gleason.....951.247.7429
- Gazette Dist...Cornel + Ruth Gleason.....951.247.7429
- Finds/Month...Edna + Terry Wade.....909.883.2198
- Gold Sales.....Steve Schubert.....951.943.0535
- Lady Luck.....Neva Golsch.....909.944.0775
- Librarian.....Robert Garcia.....909.335.4398
- Membership...Bural LaRue.....909.874.5664
- Program.....John Howell.....951.247.1037
- Refreshments...Lee + Dee Hoffman.....760.364.4256
- Web Master...Gary Schizler.....435.813.2237



**Humor in the Club**

**Geologists have paleomagnetic personalities, they do geophysical exercises, they never lose their luster, they don't wrinkle or show lineation, they are faultless, frequently have sedentary behavior, are plagued with orogenous zones and hot spots, suffer from subduction, and are gneiss people. . . everyone else is just schist.**

**An elderly couple were going to celebrate their 50th wedding anniversary and so the wife told her husband she wanted to go to the most expensive place in town this evening. The loving husband agreed so they got all dressed up and the husband drove her to the local gas station.**

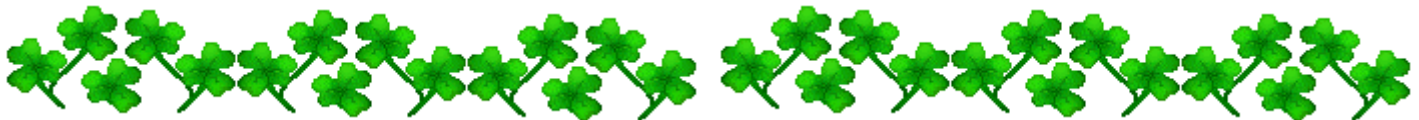
## The Vice Prezzzzzz Sayzzzzzz:

The last few months have saddened by the lost of a number of long-time members, several who have been very active in Valley Prospectors. Now we have lost another. I am writing the "Pres Says" column because the day before the last general meeting, Alice Corey, the current president, passed away. Active over many years as a board member and other positions, including the membership chairperson, Alice was well known to most members, especially with the long-time members for her wild costumes worn at the former Pasture Fairs. Though her outspoken attitude irritated some members, she always wanted the best for Valley Prospectors, even when she was sure she was the only one who knew what that was. In giving with her last wishes, a final farewell will be held at Holcomb Valley in early summer during an outing/pot luck then her ashes will be scattered there. With Chuck and Tanya Smith moving to Arizona, and Alice's death, replacements are needed on V.P.'s board. At the general meeting, nominations were held, and mail ballots were to be sent out, but it has been pointed out that is not the procedure provided by our constitution and bylaws. Therefore, the actual election will take place by voice vote at the general meeting on March 30<sup>th</sup>. Kent Bryant, currently a member-at-large was nominated for president without opposition. That leaves two (2) vacancies for alternate member-at-large. Nominated were Debby VanHolland, Bart VanHolland, Gary Crabtree, and Don Baranaskas.



### *In Memory of Our President*

*We were sadly informed of the passing of Alice Cory. She passed away on February 26, 2006. She was in assisted care only a week. Alice worked almost to the end for what she loved. . . the club for whom she dedicated much of her time and energy. Unselfish, caring, dedicated, hard working, with out question a worthy President. Our thoughts and prayers are offered to Norm, her loving husband. She will be greatly missed. Heaven is a brighter place for the gold that shines from Alice's heart.*



### Editor's Corner

**Thank you again for the second month, my dear club members, who have signed up for email Gazette. Members are signing up every week. We will have two more drawings selected from those who have signed up so far for email Gazette. At the next general meeting, two people will win a \$10 gold bag. Remember, our goal is for 100 members to sign up this year and so far we are more than half-way there. We received happy notices from the winners of last-month's drawing. Get on the list, join the winners, and help us save our resources and a few trees as well. As we plan our outing to Coolgardie, don't forget to invite a friend to join in on our prospecting fun. Friendship is invaluable. Phil and Mary Mary are hosting as wagon masters. We all know how much these two can liven up an event. I understand there will be a few**

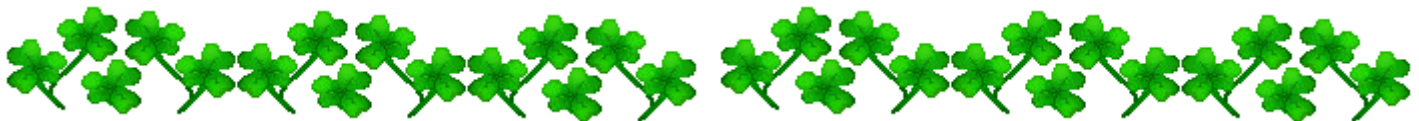
surprises waiting for the Lucky Members who join in. Phil and Mary Mary says on Saturday, early evening, we will have an Old Night In Mexico. Bring something Mexican to the camp. Also, bring a dessert to share at the campfire.



## Phil & Mary Mary, Wagon Masters of Coolgardie Outing Says. . . Theme is "Night in Old Mexico"

Starting Friday, March 24, 25, 26 if not raining.  
Place changed from Ransberg to Coolgardie.

Mexican Pot Luck dinner Saturday night at 4 pm.  
Mary will bring tamales. Everyone Sign-In at camp.  
Phil & Mary Mary are staying at the Econo Lodge room 201 upstairs on Main street Barstow, CA.  
Econo Lodge businesses in area give 10% discount if you show your room card! Sunday breakfast on claim is continental donuts + juice. Saturday night starting at 4:00 pm is a crazy hat and song contest. Bring your Mexican Hat and your throat! Call Mary Mary for more details at 951-369-8658.



### VP GENERAL MEETING 23 FEB 2006

Called to order by Vice President John Howell 7:10 pm. Pledge led by George. Courtesy: Jack 2 new members 1 guest. President Alice Corey passed away. Valley will miss her. Waive reading of past minutes 1st Dan 2nd Allen passed. Treasurers report: Pat. Correspondence: Steve, Mona West passed away, read Gem club fliers, and Trish read letter from Norm expressing Alice's last wishes about having a pot luck in Big Bear instead of a funeral service. Valley prospectors will honor her last wish and Norm will pick the date in June. Special raffle rocker box by Bill. 50/50 Bill and Lady Luck Dan. Membership: Pat, dues are due and transition from Norm to Bural new cards may be delayed. Wagon master Phil and Mary Mary will be at the March outing at Coolgardie March 24th, 25th, and 26th. Gold sales: Steve will set up a booth in Old Town Temecula Feb 25th. This is your last chance to buy gold at the old price. Sold \$385.00. Library: Robert, Bob donated books. Editor: Cornel we have an email glitz for newsletter as it is being worked out. Gold bag raffle for email signup. Claims: John, Summit Sunday snowed in. Big Bear closed due to snow. Assessors news and more paperwork still looking for claims one in AZ. Blood bank: Maryno donations in Feb. Program: John we will have a special election to fill positions opened. Nominations for president Kent Bryant. Board and alternate members Debby VanHolland, Bart VanHolland, Gary Crabtree, and Don

Baranaskas. Refreshments: Dee, March green cake and ice cream. Old business: Dan Iris festival May 19th, 20th, and 21st we will be there. Mary Mary will be collecting pull tabs for Ronald McDonald house. Terry: Northern claims campsites washed out and river course changed. Still need a liaison for our northern claims. Special raffle won by Bill. 50/50, Bruce. Door prize, Diane. Badge drawing, Wendy. Finds of the month: Traditional gold, 1st Gene, 2nd Gary, 3rd Bart, and Treasure, Lucky. Meeting closed 8:30 pm.

**VP BOARD NOTES - MARCH 2, 2006**

Valley Prospector board notes. The business board could not be conducted with only 2 executive members present. Valley Prospectors bylaws say we can have an election to fill vacant board positions at the next general meeting. We urge all Valley members to attend this important meeting. Phil & Mary Mary will be the wagon masters for the March 24<sup>th</sup> 25<sup>th</sup> and 26th outing changed to Coogardie. See you there.

Secretary Steven E. Schubert



**Blood Bank News – Mar 2006**

I wish to thank everyone who donated last month, we had 4 people donate in Feb. Lorraine, Burl, Helen, and William. Thank you all very much! At the time the bank is low on 0 neg, B neg, and A neg blood. Remember the Blood Bank needs 400 donations every day to keep up. When you donate don't forget to tell them "MVP" account!

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**UPLAND**

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## Introductory Neutrino Physics

By Cornel Gleason

A few days ago a friend asked me why we spend so much money studying neutrinos. The more I explained. . . the more he asked. I could see that my description was getting me into a rather lengthy process of chit chat that left him with more questions unanswered than when he started. I answered a few basic questions and was explaining some of the on going experiments when another friend came up and entered into the conversation. I soon realized that most people do not realize what the significance is about neutrinos or for that matter why we study them at all. Maybe this small article will address some of these same questions and will inspire you to look into this very small particle yourself.

**History** – First predicted by Wolfgang Pauli in 1930 and confirmed by Enrico Fermi in 1933. The reason why this particle eluded scientist for so long is because this particle is extremely small and has no electrical charge. Its size is believed to be 10,000 to 1,000,000 times smaller than an electron. Because of its small size and neutral charge, this particle travels through all known mass. It actually travels between the atoms of matter unaffected. Light that is produced by the sun's reactive core takes 10,000 years to emerge from its surface and an additional 8 ½ minutes to arrive here on Earth. Thus, the daylight we see is 10,000 years old. Neutrinos move through the sun's mass in seconds. They are so small and have so little mass that the sun's gravity does not affect them. To say that neutrinos are unaffected by gravity is very profound. Even light is affected by gravity. On Earth, our two lightest elements, Hydrogen and Helium are so small in mass and density that the Earth's gravity is unable to hold these elements from floating upward through our atmosphere and into outer space. On the Sun, their density is similar to lead on Earth. If you could withstand the heat, and the massive gravitational pull of the Sun, you could walk on its surface of gas. Neutrinos are unaffected by gravity, travel through dense mass, and exceed the speed of light. Is it any wonder that our greatest physicists study them?

Neutrinos are apparently released from the nucleus of atoms that degenerate during the decay

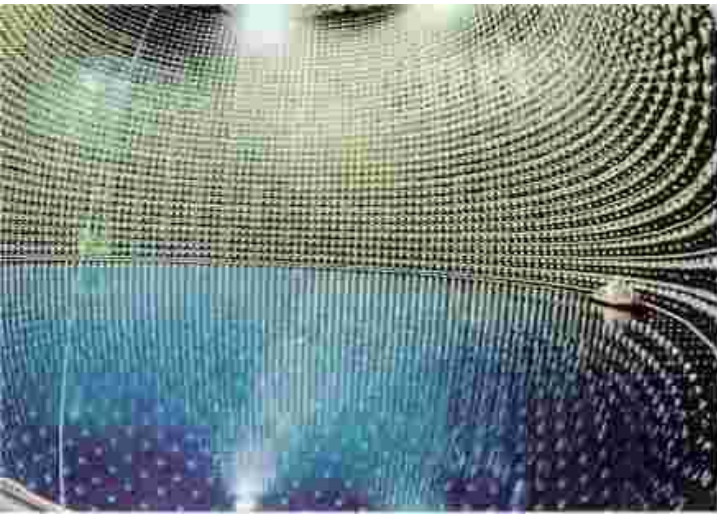
process of beta radiation that is released during solar fusion, supernova, and nuclear power plant production. They traverse the universe leaving a footprint, or maybe a very small fingerprint, that can only be detected by very specialized and expensive equipment. Their fingerprints are so minute that mapping their history has become the challenge of nations. To accomplish this task, nations have built huge facilities to detect their presence. Neutrinos release very minute photon light sources as they traverse thru various materials such as heavy water. So far these materials have been limited to mediums containing lightweight elements and a few halogens. Only a few neutrinos hit the nucleus of atoms and modify the elements thus releasing photons. To separate out background sources of energy released throughout our planet, these detection facilities are located deep in the Earth, usually in an abandoned gold mine or in a deep nickel mine. Japan's Kamiokande facility, Canada's Sudbury facility, and Antarctic's Amanda and new Ice Cube project are all examples of ongoing neutrino observatories that have been built or under construction.



The Canadian [Sudbury Neutrino Observatory](#) (SNO) uses [heavy water](#) (above).

The Sudbury Neutrino Observatory (SNO) uses thousands of gallons of deuterium (heavy water) inside the metal sphere. In addition to the neutrino interactions available in a regular water detector, a deuterium molecule in the sphere can be broken up by a neutrino. During this collision a free neutron is subsequently captured, releasing a burst of gamma rays which are detected. All three neutrino flavors participate equally in this dissociation reaction. The reaction results in a photon release that is detected by the thousands of sensors that you can see attached to the outside of the sphere in the photo.

The three flavors of neutrinos mentioned are more likely to be more than three, but only three have been discovered to date. The most common found is the electron neutrino. A much smaller percentage of muon neutrinos is produced and the third is the tau neutrino. Out of millions of neutrinos only a few are tau neutrinos. Maybe in the future a fourth will be discovered. Both the muon and the tau were much more difficult to detect because they only last a brief moment before they are absorbed into another atomic nucleus. The electron neutrino, however, traverses the universe seemingly unaffected until captured by a natural atomic collision or maybe in one of our telescopes. They have been described as having a density here on earth of 400 neutrinos per cubic square the size of a sugar cube.



The picture above shows the filling of the Super Kamiokande, a solar and atmospheric neutrino detector in Japan. This facility is currently on line.

The three flavors of neutrinos mentioned were actually named after the pairing partner that they are matched with. Electrons, muons, and taus are all particle components of atoms. Their much smaller paired components are the neutrinos or little neutral particles. The first actual detection of neutrinos occurred in 1956 by Clyde Cowan and Fredrick Reines who found a convenient source of neutrinos. . . nuclear power plants. Power is created in nuclear plants when atoms undergo nuclear fission, a process of which the neutrino is a byproduct. Cowan and Reines used a 400 liter tank of cadmium chloride as their target. The neutrinos struck a proton inside the target, producing a positron and a neutron. That positron encountered an electron; the two annihilated each other, producing two gamma rays (or photons). The neutron was absorbed by a cadmium chloride atom, producing a photon at a 15-microsecond delay from the emission from the positron. Using this knowledge of the photon emission, Cowan and Reines were able to detect the electron neutrino. Reines, four years later, earned the Noble Prize for his work.

Neutrinos are categorized as Leptons. The tau neutrino remained in hiding for many years until researchers overcame two major obstacles. First, the tau lepton has an extremely short lifespan of about 300 femtoseconds. Because neutrinos are detected by tracking their charged lepton partners, the lepton partner must be relatively easy to track. However, since the tau has such a short lifetime (even at relativistic speeds) it is difficult to detect. Secondly, tau neutrino production is very rare. Out of  $10^{13}$  neutrinos produced, only  $10^3$  neutrino interactions result in 4 tau neutrinos being detected. I wasn't until the year 2000 that tau neutrinos were detected.

The Super-Kamiokande detector to the left is a 50,000 ton tank of water, located approximately 1 km underground. The water in the tank acts as both the target for neutrinos, and the detecting medium for the by-products of neutrino interactions.

The inside surface of the tank is lined with 11,146 50-cm diameter light collectors called "photomultiplier tubes". In addition to the inner detector, which is used for physics studies, an additional layer of water called the outer detector is also instrumented with light sensors to detect

any charged particles entering the central volume, and to shield it by absorbing any neutrons produced in the nearby rock.

Charged particles (and only charged particles) traversing the water with a velocity greater than 75% of the speed of light radiate light in a conical pattern around the direction of the track. This light is bluish in color and is called Cherenkov light. It is transmitted through the very pure water in the tank, and eventually falls on the inner wall of the detector, which is covered with photomultiplier tubes (PMT's). These PMT's are each sensitive to illumination by a single photon of light at light levels approximately the same as the light visible on Earth from a candle at the distance of the moon! Now you can see how extremely sensitive these telescopes are and why they are buried deep within the Earth's crust.

The Antarctic Muon And Neutrino Detector Array (AMANDA) is a neutrino telescope located beneath the [Amundsen-Scott South Pole Station](#). It consists of optical modules, each containing one photomultiplier tube, sunk in the Antarctic ice cap at a depth of about 1500 to 1900 meters. In its latest development stage, known as AMANDA-II, AMANDA is made up of an array of 677 optical modules mounted on 19 separate strings that are spread out in a rough circle with a diameter of 200 meters. Each string has several dozen modules, and was put in place by "drilling" a hole in the ice using a hot water hose, sinking the cable with attached optical modules in, and then letting the ice freeze around it.



Arial view of Amundsen-Scott South Pole Station

The ice at the station is so pure and free of contaminants that the Cherenkov light reactions

are detected by the incircling PMT's. The ice becomes the housing for the sensors and the medium for the neutrino reactions. This massive telescope is aptly called Ice Cube.

AMANDA detects very high energy neutrinos (50+ GeV) which pass through the Earth from the northern hemisphere and then react just as they are leaving upwards through the Antarctic ice. The neutrino collides with nuclei of oxygen or hydrogen atoms contained in the surrounding water ice, producing a muon and a hadronic shower. The optical modules detect the Cherenkov radiation from these particles, and by analysis of the timing of photon hits can approximately determine the direction of the original neutrino with a spatial resolution of approximately 2 degrees.

So far the target medium has been limited to water, or heavy water, halogen solutions, hydrocarbon solutions, and ice. The resulting atomic changes from chlorine to argon and several other atomic modifications has been limited to fairly lightweight atoms. The key so far has been telescope medium of sufficient clarity to use PMT's in order to detect Cherenkov light. One day we may hear of mediums or solutions containing heavier metals. One in particular comes in mind. It's a metal with an atomic density of 19.3, yellow in color, and is near and dear to each of our hearts. Can you guess what I'm thinking?

Without the following organizations/countries this work, much less this article, would be impossible.

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