

Vandenberg Amateur Astronomical Society presents The Sidereal Times



Pillars of Creation (see page 5)

Meeting News:

At the January meeting we had a good showing of members at Mi Amore, discussed some past and future events. Also talked about a planetarium show at one of our meetings. Also a new member Welcome Elizabeth Hatten.

Reminder: VAAS club meeting Feb 9th 7:00 PM Saint Mary's Church Just up the hill from the the Lompoc Wye, Highway 1 Harris grade road.



Lunar Calendar:

New Moon 15th

Full Moon 1st

2018 VAAS New Year Party



Presidents Message

Hello, All.

Well, we certainly had a fun and satisfying gathering at the Annual Pizza Party. So nice to see such a large number of us gathered together. There seemed to be a lot of excited conversation at each table and I know that my wife Molly came home very impressed with all she learned from listening to Dave, Ken, and Jay swap stories and problem-solving ideas. Jana passed around excellent photos of her up-close visit to the Delta rocket at SLC 6. On the business end of things, we did very well collecting our 2018 dues, thank you all very much; and we gained a new member in Liz and a possible with Bonnie! Indeed, a great way to start 2018.

Our February 9th meeting will NOT be held at our usual location. We will instead meet at Saint Mary's Church, which is just up the hill above the Highway 1/Harris Grade Road intersection [commonly called "The Wye"]. Vince Tobin will host our program that evening, beginning at 7:00 PM: a demonstration of the Alan Hancock Community College mobile planetarium! Vince and Mark Bumgarner gave me a demonstration of this amazing unit the other night, and I can assure you that a real treat is in store! Prior to the meeting I will email each of you more information and directions to Saint Mary's.

Finally, in "developing news," on May 3rd we will host a public program at the Grossman Gallery of the Lompoc Library featuring a member of the JPL Mars InSight Mission team. Mars InSight, scheduled to launch two days after the program, is very important in the history of VAFB, as it is the FIRST interplanetary mission launched from the base. The program is a joint presentation of VAAS and JPL. There will be a slide show and possibly models on display. More details will be shared as they become available. Our regular Society meeting will still be held on Friday, May 11th, with Dr. Joe Bassi returning to take us through the history of manned space flight.

I look forward to seeing all of you on the 9th; until then, keep your eyes...

Skyward,
Tom

Events

Feb 10th *Star party at the observatory.*

😊 Yea!

Feb 15th Partial Solar Eclipse occurs when the Moon only covers Part of the Sun sometimes like taking a bite out of a cookie. A partial Solar eclipse can be safely observed with a special; solar filter or by Looking at the Sun's reflection. This partial eclipse can only be visible in parts of Chile, Argentina and Antarctica.

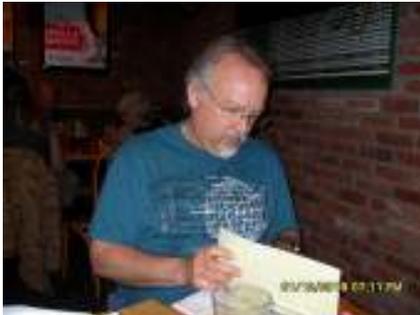
Feb 17th *Star party at the observatory.*

😊 Yea!

Feb 24th *Star Party at the observatory.*

😊 Yea!

VAAS 2018 New Year Party



Star party's and Events

Jan 13th Star Party at the Observatory. Vince, Dave, Rick and Vahan on site. Was overcast but parts of the sky cleared up a bit. Rick set up his 8" SCT. And Vince and Dave had the Observatory up and running. It was a little catch as catch can with stars but it was a fair night under the stars.

😊 Yes!

Jan 20th Star Party at the Observatory. Star party cancelled due to weather.



Nuts!

Jan 27th Star Party at the Observatory, Dave on site. No one else showed up and since it was cold and windy, secured and departed.

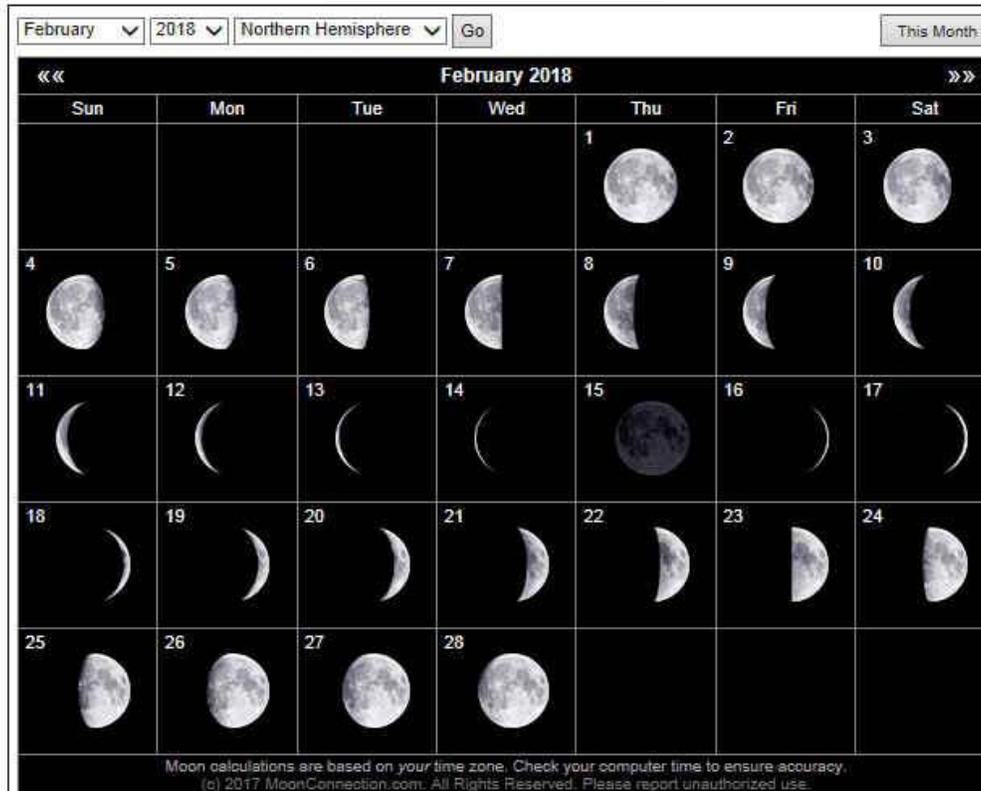


Ugh!

VAAS 2018 New Year Party



February 2018 Moon



Full 1st, New 15th, 1st Quarter 23rd, Last Quarter 7th

Moon Facts

Apollo Moon Trees

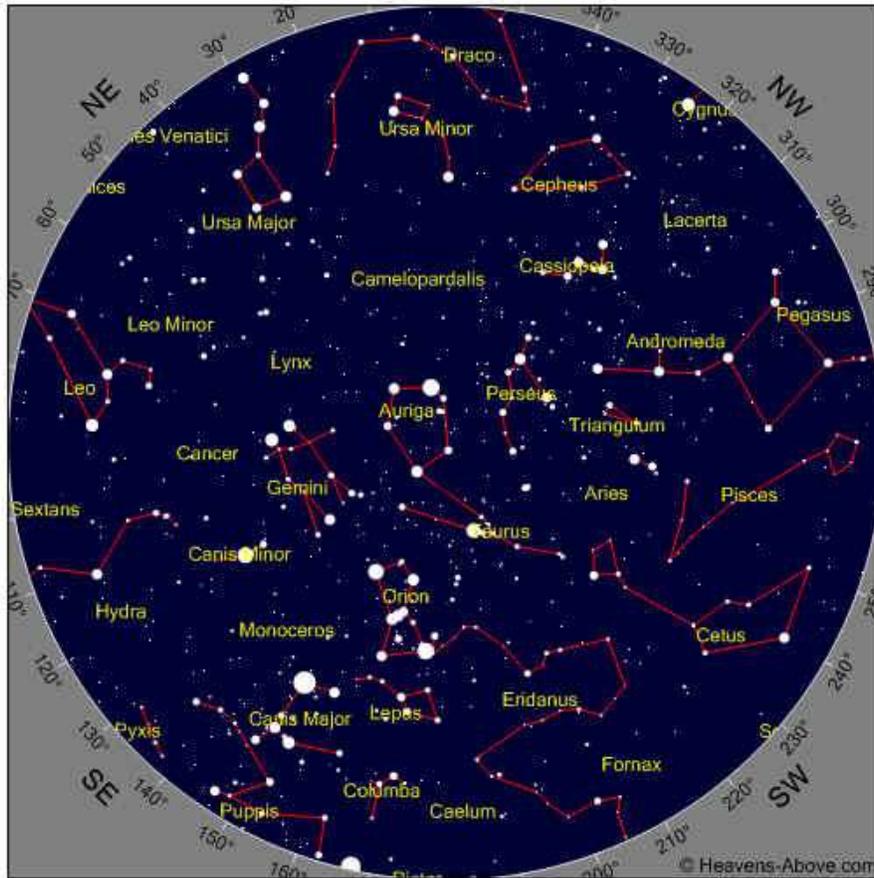
More than 400 trees on Earth came from the Moon. Well Okay, they came from lunar orbit. In 1971 Apollo Astronaut Stewart Roosa took a bunch of seeds with him, and while Alan Shepard and Edgar Mitchell were busy sauntering around on the surface, Rossa guarded his seeds. Later the seeds were germinated on Earth, planted at various sites around the country and came to be called the Moon Trees. Most of them are still doing just fine.

The Moon's heavily cratered surface is the result of intense pummeling by space rocks between 4.1 billion and 3.8 billion years ago. The scars of this war, seen as craters, have not eroded much for two main reasons: The Moon is not geologically very active, so earthquakes, volcanoes and mountain building don't destroy the landscape as they do on Earth. With virtually no atmosphere there is no wind or rain, so very little surface erosion occurs.

More VAAS 2018 New Years Party



February 2018 Sky
Some Objects of interest M1, M42, C14, Moon



Time

Year	2018	Month	2	Day	3	Hour	20	Minute	4
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Some Past events



Photo Courtesy HubbleTelescope



The Pillars of Creation one of the most iconic and popular images located in Messier 16 NGC 6511, the Eagle Nebula. It is a star forming nebula located in the constellation of Serpens. It occupies an area of 70 to 55 light years (30 arc minutes of sky). This image is as seen in visible light capturing the multi-colored glow of gas clouds, wispy tendrils of dark cosmic dust, and the rust-colored elephant's trunks of the nebula's famous pillars. The blue colors represent oxygen, red is sulphur and green is nitrogen and hydrogen. The dust and gas in the pillars is seared by the intense radiation from young stars and eroded by strong winds from massive nearby stars. With these new images comes better contrast and clearer view for astronomers to study the structures of the pillars. The pillars are 6500 to 7000 light years distant. The name is based on a phrase in a sermon, "The Condescension of Christ". The pillars are composed of cool molecular hydrogen and dust that are being eroded by photoevaporation from the ultra violet light of relatively close hot stars. The left most pillar is about 4 light years in length. The finger like protrusions at the top of the clouds are larger than our solar system and are made visible by shadows of evaporating gaseous globules (EGGs) which shield the gas behind them from intense UV flux. EGGs are themselves incubators of new stars. These stars emerge from the EGGs which are then evaporated.

For What it's Worth

Stars last a long time, but eventually they will die. The energy that makes up stars, some of the largest objects we ever study, comes from the interaction of individual atoms. So, to understand the most large and powerful objects in the universe, we must understand the most basic. Then, as the star's life ends, those basic principles once again come into play to describe what next will happen to the star.

Birth of a Star The stars took a long time to form, as gas drifting in the universe was drawn together by the force of gravity. This gas is mostly hydrogen, because it's the most basic and abundant element in the universe, although some of the gas might consist of some other elements. Enough of this gas begins gathering together under gravity and each atom is pulling on all of the other atoms. This gravitational pull is enough to force the atoms to collide with each other, which in turn generates heat. In fact, as the atoms are colliding with each other, they're vibrating and moving more quickly (that is, after all, what heat energy really is: atomic motion). Eventually, they get so hot, and the individual atoms have so much kinetic energy, that when they collide with another atom (which also has a lot of kinetic energy) they don't just bounce off each other. With enough energy, the two atoms collide and the nucleus of these atoms fuse together. Remember, this is mostly hydrogen, which means that each atom contains a nucleus with only one proton. When these nuclei fuse together (a process known, appropriately enough, as nuclear fusion) the resulting nucleus has two protons, which means that the new atom created is helium. Stars may also fuse heavier atoms, such as helium, together to make even larger atomic nuclei. (This process, called nucleosynthesis, is believed to be how many of the elements in our universe were formed.)

Burning of a Star So the atoms (often the element hydrogen) inside the star collide together, going through a process of nuclear fusion, which generates heat, electromagnetic radiation (including visible light), and energy in other forms, such as high-energy particles. This period of atomic burning is what most of us think as the life of a star, and it's in this phase that we see most stars up in the heavens. This heat generates a pressure - much like heating air inside a balloon creates pressure on the surface of the balloon (rough analogy) - which pushes the atoms apart. But remember that gravity's trying to pull them together. Eventually, the star reaches an equilibrium where the attraction of gravity and the repulsive pressure are balanced out, and during this period the star burns in a relatively stable way, until it runs out of fuel.

The Cooling of a star As the hydrogen fuel in a star gets converted to helium, and to some heavier elements, it takes more and more heat to cause the nuclear fusion. Big stars use their fuel faster, because it takes more energy to counteract the larger gravitational force. (Or, put another way, the larger gravitational force causes the atoms to collide together more rapidly). While our sun will probably last for about 5 thousand million years, more massive stars may last as little as 1 hundred million years before using up their fuel. As the star's fuel begins to run out, the star begins to generate less heat. Without the heat to counteract the gravitational pull, the star begins to contract. All is not lost, however! Remember that these atoms are made up of protons, neutrons, and electrons, which are Fermions. One of the rules governing Fermions is called the Pauli Exclusion Principle, which states that no two Fermions can occupy the same "state," which is a fancy way of saying that there can't be more than one identical one in the same place doing the same thing.

Death of a Star The result of this is that the Pauli Exclusion Principle creates yet another slight repulsive force between electrons, which can help counteract the collapse of a star, turning it into a white dwarf. This was discovered by the Indian physicist Subrahmanyan Chandrasekhar in 1928. Another type of star, the Neutron star, come into being when a star collapses and the neutron-to-neutron repulsion counteracts the gravitational collapse. Chandrasekhar determined any star more massive than about 1.4 times our sun (a mass called the Chandrasekhar limit) wouldn't be able to support itself against its own gravity and would collapse into a White Dwarf. It's possible that when the star is dying it might go through Nova or Super Nova, expelling enough mass out into the universe that it drops below these limits and becomes one of these types of stars. Stars ranging up to about 3 times our sun would become Neutron stars. Beyond that, though, there's just too much mass for the star to counteract the gravitational pull through the exclusion principle, below these limits and becomes one of these types of stars ... but if not, then what happens? Well, in that case, the mass continues to collapse under gravitational forces until a Black Hole is formed. And that is what you call the death of a star.

Note: Fermions are sometimes called matter particles because they are the particles that make up what we think of as physical matter, including protons, neutrons, and electrons.

Club Officers



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Tom Gerald

Vice President
Jana Hunking



Treasurer
Andy Wallace

News Letter Editor
Vahan Yeterian

*“Astronomy compels the soul to look upward,
and leads us from this world to another”.*
(Plato)



Club Meeting

Reminder Club meeting Feb 9th at 7:00Pm
Saint Mary’s Church, at the Wye.
Star Parties (as always weather permitting)

Other Astronomy Club Meetings

Central Coast Astronomical Society

Link to web site...

<http://www.centralcoastastronomy.org/>

Santa Barbara Astronomical Unit

Link to web site...

[http:// www.sbau.org/#AU_EVENTS_Calendar](http://www.sbau.org/#AU_EVENTS_Calendar)

Night Time Bright Objects (no scope required)

Link to “Heavens Above” web site

[http:// www.heavens-above.com/](http://www.heavens-above.com/)

(Iridium Satellite)

(ISS Visible Pass)

Be sure to set the nearest location from their
pull-down menu.

The web site link below will take you to some
Great Milky Way interactive images and how
It was developed. (Type it in the search box.)

<http://skysurvey.org/>

VAAS.

Dave McNally is the VAAS Web Site Serf/Minion

Dave

