



SVAS

Vol.74 No.4* July-August, 2017

OBSERVER

Sacramento Valley Astronomical Society

Founded in 1945



Don't Miss!
Total Solar Eclipse
August 21, 2017

Photo by Dave Buchla

Inside This Issue

- 2 SVAS Current Event Calendar
- 3 More About Upcoming Star Parties
- 4 SVAS Clothing
- 5 International Sun-Day, Powerhouse Science Center
- 8 The Great American Total Eclipse
- 9 California Montessori School Star Party
- 10 Lagoon Nebula, by Charles Jones
- 11 In memoriam: Jerry Nelson (1944-2017)
- 14 HGO Report
- 15 The Fuzzy Seas of Titan
- 16 SVAS Main Events & Sponsors
- 17 Classifieds
- 18 SVAS Officers, Board, Members, Application

This issue of the Observer talks about a few things to look for during the upcoming August 21 total solar eclipse. Last month, we featured a great article by Dave Buchla on Solar Eclipse Photography. Check it out for some great photo advice and eclipse viewing details. He will be our guest speaker at Star B-Q, so don't miss this chance to ask questions of our own eclipse expert!

See page 8

SVAS Current Event Calendar

July 20, Thurs, 6:00pm, SVAS Board Meeting

6:00 pm, JR's BBQ, 180 Otto Circle, Sacramento, CA.



July 21-23, Fri –Sun, Star-B-Q

No General Meeting, We will meet at Star-BQ.



July 22, Rusch Park Family Campout

Not attending SBQ? Please volunteer! Contact Wayne Lord.



July 29, Barns & Noble Outreach Star Party

Across from the Galleria. Contact Kevin Normington.



Aug 11-12, Fri-Sat Glacier Point Star Party

Contact Tom Braun. Limited attendance.

Aug 18, Friday, 8:00pm, SVAS General Meeting

Sac City College, Room L101, 3835 Freeport Boulevard, Sacramento, CA.

SVAS Board meeting at JR's BBQ, 6:00-7:30pm, 180 Otto Circle, Sacramento, CA



Aug 21, Monday, Solar Eclipse!

If you are staying in Sacramento for this event, be sure to attend the SVAS local viewing at the Powerhouse Science Center. Contact Walt Heiges

*****Please visit SVAS.Org for contact Information*****

 Blue Canyon July 21-23 Star B Q Aug 19 Sept 16 & 23 Oct 21 Nov 18 Dec 16	 New Moon July 22 Aug 21 Sept 19 Oct 19 Nov 17 Dec 17
---	---



Community Star Parties

 Contact Wayne Lord

More About Upcoming Star Parties



Graeagle is one of my personal favorite non-SVAS events! Dark skies, free tent camping for sharing your views with the locals, and great restaurants! Contact our own Dave Buchla to RSVP, limited attendance.



Yosemite's Glacier Point is a very special SVAS event! Nothing compares to the terrain vistas and great viewing! Contact Tom Braun to RSVP, limited attendance.

****Please visit SVAS.Org for contact Information****



SVAS is Hosting a Public Solar Eclipse Viewing, at the Powerhouse Science Center, Aug 21, 2017. Volunteers Needed! Contact Walt Heiges

Black Butte Lake Star Party

This is another great non-SVAS star party, hosted by a SVAS member. It's a great site, the entire group campground is reserved for astronomers. At near sea level, just a few miles from Orland off I-80, it has some of the darkest skies around. Great campfires, hot showers, gazebo, paved observing area. Come join in the fun. Google web site for more info.

Sept 16-20

Please RSVP Jack Sales. Limited Attendance.



SVAS Clothing

Contact Charles Jones

These prices are for just one single item, that you can order and pay for yourself. No more waiting to complete a large minimum order, and order at any time you like. Please talk to Charles about color.



Vistaprint.com

Embroidered Hoodies



\$50.00
Logo Included
Ask about available color
+S&H

Embroidered Men's Polos



\$25.00
Logo Included
Ask about available color
+S&H

Embroidered Women's Polos

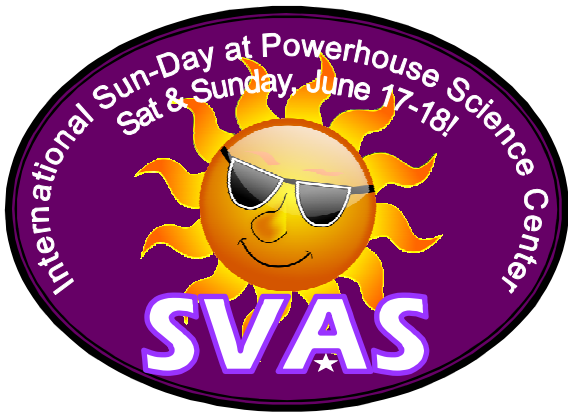


\$25.00
Logo Included
Ask about available color
+S&H

Embroidered Hats



\$18.00
Logo Included
Ask about available color
+S&H



We managed to pick the hottest weekend in quite a while this year, right after a long cool spell. The sudden heat deterred a few folks from attending, but we still had a great time! Our canopy, the blue one just left of center, was mostly in the shade of the redwoods, and was quite comfortable as a frequent cooling station after standing in the hot sun. Walt and I did a short video for ch31, very early Sat morning. We were concerned there



could be a large turnout because of the advertising, but it never materialized. Still, we had some great guests, some who attend yearly. We had a few sunspots to watch, and some interesting solar flares. The Sun is in a quiet time right now, approaching the minimum for sunspot activity. Our special thanks to Walt Heiges, Kevin Normington, Tom Braun, David Macho, Raj Dixit, Bill Hagbery, Ralph Merletti, and Jerry Dubesa for helping present this great event. My apologies, I missed one other members name.

Newsletter Editor





As you can see in the previous photos, we had a great time. The shaved ice truck was hugely popular, and I insisted she give us a last call before leaving. Bill Hagbery, photo below, is enjoying a spray bottle misting to keep cool. We all wore wet scarves around our necks, and I misted my shirt, pants, and hat several times. Frozen water bottles were available too.



Until next year, keep watching our Sun!

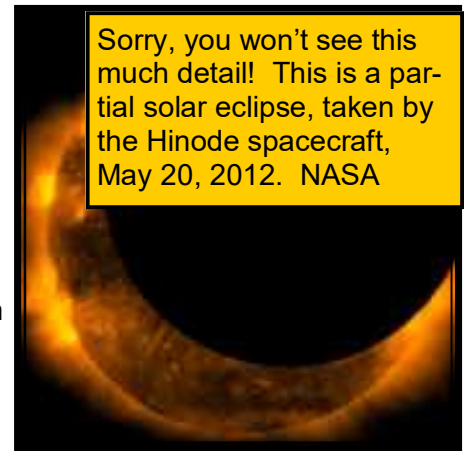
Newsletter Editor

The Great American Total Eclipse August 21, 2017



A total solar eclipse in the continental US is a very rare event, the last one was in 1979! All the others were partial eclipses. If you stay in Sacramento, you will only see about a 79% partial eclipse. Do your best to plan a trip to the nearest path of totality, this is an absolutely do not miss opportunity to experience a total solar eclipse!

It's so important to be careful when viewing the Sun! Use only solar approved filters, and make sure they are securely attached to your optics. Do not use welders glasses (#14 are considered safe), sunglasses, camera film, or smoked glass! It only takes an instant to cause permanent eye damage! Never use the old style filters that screwed into the eyepiece filter threads, they can get very hot and possibly crack or break! It's only safe to view the eclipse, without a filter, for the brief time the Sun is "**totally**" covered by the Moon. You can still get retina burns when 99% of the sun is blocked! Get ready to cover your eyes and equipment the second the Sun peeks out again from behind the Moon.



Sorry, you won't see this much detail! This is a partial solar eclipse, taken by the Hinode spacecraft, May 20, 2012. NASA

First Contact Where the Moon's edge first touches the Sun's edge.

Possible Rare Shadow Bands

A minute or so before totality, thin wavy parallel lines are created by the slit-like solar crescent reacting with atmospheric winds. Let everyone know if you see them.



Diamond Ring & Baily's Beads

Just before totality, the opposing horns of the thin disappearing solar crescent come together forming the **Diamond Ring**. The solar atmosphere seen around the perimeter of the Moon completes the ring. As the sun's opposing crescent horns close, they eclipse the diamond and leave only the ring. Then **Baily's Beads** briefly appear from the shafts of remaining sunlight glistening through the mountains and valleys of the moon's surface. As the Moon covers the last of the beads, it marks the moment of **Second Contact** and the beginning of totality.

Photos by Dave Buchla

Diamond Ring **Baily's Beads**



Totality

The Sun is completely covered by the Super Moon, and only the sun's corona is visible. Feel the temperature change. The twilight effect will be equal 360 degrees around the horizon. Watch for solar prominences! You should see Regulus, Mercury, Mars, Venus, and Jupiter, nearby in the darkened sky. When Baily's Beads begin to reappear, it marks the end of Totality and **Third Contact**. Watch for the second Diamond Ring as the sun's crescent horns begin to open. **Fourth Contact** occurs as the Moon just leaves the Sun. Enjoy!





School Star Party

Report



Lagoon Nebula

by Charles Jones



Lagoon Nebula taken at GSSP on June 23, 2017.
Taken with a Celestron C6 OTA on a Celestron AVX mount
ZWO ASI 1600 MM-C and RGB filters total time 24 x 3 min or 1.2 hours.

In Memoriam: Jerry Nelson (1944-2017)



Remembering a legend, pioneer, and father of the W.M Keck Observatory telescopes.

“You can’t. It’s never been done. It’s impossible,” they said. But Jerry Nelson believed he could. He did. And he proved that it is possible.

“He was a giant. Even if you didn’t really know him, you could just feel that this guy was a genius,” said W. M. Keck Observatory principal engineer Dennis McBride, who worked with Nelson on commissioning the Keck I telescope in the early ‘90s. “When he walked into the room, you just knew it. So many people said that it would not work, including some of our astronomers, but they were all wrong. It works spectacularly well.”

As the mastermind behind the revolutionary segmented primary mirror design of Keck Observatory’s 10-meter twin telescopes on Maunakea, Hawaii, Nelson, an astronomer and astrophysicist at the University of California, Santa

Cruz, significantly transformed the landscape of modern astronomy, catapulting scientists into a cosmic arena where they could peer far deeper into space than ever imaginable.

And he succeeded in doing so with such intellectual rigor, that to this day, more than 30 years later, Nelson’s invention continues to push astronomical boundaries by way of the next generation of the world’s largest telescopes - many of which are modeled after his segmented mirror design, including the planned 39-meter European Extremely Large Telescope, the Thirty Meter Telescope, and the James Webb Space Telescope.

“I think eventually, people will note him in history as being one of the people who made one of the major advancements in astronomy since Galileo’s telescope,” said Barbara Schaefer, retired observing support coordinator at Keck Observatory who worked with Nelson during his time as project scientist for the Keck Observatory telescopes. “He defined how astronomy was going to be done at least for the next 100 years, if not longer,” added McBride. Prior to Nelson’s breakthrough design, optical telescopes had monolithic reflecting mirrors. At the time, the Hale Telescope on Mount Palomar near San Diego boasted the largest one in the United States, with a primary mirror measuring five meters in diameter.

Doubling that size would have made for a mirror that was too heavy - the larger the mirror’s surface, the thicker it must be to prevent gravity from altering its shape. And the heavier the mirror, the costlier the project.

“Scaling up was a really bad idea,” Nelson once explained. “Thermal and gravitational problems make it completely impractical. But making something big out of small pieces is everywhere. Like tiling: The Greeks and Romans tiled everything. I was amazed at the astronomers who just had zero confidence that this would work. They all said it was impossible.”

In 1977, the “Impossible Telescope” was born out of a concept that Nelson, then an astrophysicist at the Lawrence Berkeley National Laboratory (LBL), pioneered. He crafted a mirror design consisting of 36 small, thin, hexagonal segments that perform together with nanometer accuracy as a single piece of reflective glass.



The light-gathering power of these mirrors enables astronomers to see cosmic phenomena more than 10 billion light years away from Earth, and has triggered a domino-effect of ground-breaking discoveries, from the supermassive black hole at the center of the Milky Way, to Earth-like exoplanets that may potentially have life, ancient galaxies, ultra-distant supernovae, and more.

“There would be no 10-meter telescopes without Jerry Nelson,” said Peter Wizinowich, chief of technical development at Keck Observatory, who worked with Nelson as the optics engineer shortly after Keck I was built. “What impressed me most about him was that, looking back, he was just in his 30’s. It wasn’t only about solving the problems, but convincing the powers that be to fund the project. He had the whole range of skills to make it happen. Nelson came across as brilliant, but personable. He could get along with anyone,” Wizinowich said.

“He was easy to work with, always smiling, always an incredible optimist,” said Mark Sirota, who worked with Nelson as Electronics Engineering Manager in Keck Observatory’s early years. “He was actually extremely competitive, but in a way that you never really knew until you got to know him better. Nelson was somehow extremely disciplined and determined, but he did it in a manner that was completely amazing. I don’t know anyone else like that.”

Nelson was notorious for his infamous line, ‘I don’t understand’- a mild way of signaling that you were about to fall under intense scrutiny. “As soon as he said that you knew you were in trouble because he could figure out if you knew what you’re talking about. And if you didn’t, he would pick up on it immediately. But instead of saying, ‘no that’s not right,’ he just had this way of gently letting you know that you should go back and think about what you’re saying again,” said McBride.

“Jerry could always nail you if he wanted to. In a meeting, if he really wanted to challenge you, he could really probe a design or someone’s argument and it would be tough to stand up to that argument. But he’d always start in a subtle, nice way,” said Wizinowich.

According to Schaefer, his approach and character are what set Nelson apart from other top names in the field. He was humble, down-to-earth, and had genuine respect for everyone.

“He wasn’t in it for his own glory, he was in it to figure out how to make the telescope work. That was all he cared about – solving the problems and creating something that people could use to solve the mysteries of the universe,” she said.

Mastering the segmented technology to do so required much brain power, and right by Nelson’s side to help him was the late Dr. Terry Mast, a research physicist at the University of California Observatories. “He and Terry were inseparable,”

Schaefer said. “You always said ‘Jerry and Terry.’ “I always think of them as very close together,” said Wizinowich. “Because together, they were probably a lot more powerful than either of them individually.” Perhaps the duo’s greatest power was having a strong sense of teamwork. “It didn’t matter if you had a PhD or if you were a student - they had respect for everybody. There wasn’t a ‘them’ or an ‘us’ – that was the day-to-day feeling of that office. Everyone was equally a part of this big exciting project and it made for a really amazing environment to work in. You don’t always find that from people who are at the top of the field,” said Schaefer.

Nelson, a member of the National Academy of Sciences, certainly was at the very top, with a resume impressively littered with prestigious awards and high honors, including the 2010 Kavli Prize in Astrophysics, the Benjamin Franklin Medal in Electrical Engineering, the André Lallemande Prize of the French Academy of Sciences, and the Dannie Heineman Prize for Astrophysics of the American Astronomical Society. The accolades for his achievements extend beyond Nelson’s work as telescope designer. He also was a trailblazer in the field of adaptive optics. As the founding director of the Center for Adaptive Optics at UC Santa Cruz, Nelson was at the forefront of arming astronomers with a system that would give them an unprecedented, ultra-sharp view of the cosmos.

What was the secret to his success? Nelson, a Caltech alumnus who received his PhD in physics from UC Berkeley in 1972, had a knack for untangling sophisticated problems by simply - yet meticulously - going back to the basics. “When he looked at a problem, he would always go back to what he would call Freshman physics, and he would solve the problem from the very beginning,” said Schaefer. “Other people would often just take something at face value or believe what so-and-so said, but Nelson was always going back to fundamental principles to make sure he not only understood how things worked, but really believed it,” she said. “Nelson was able to quickly understand the core issues when problems surfaced; he knew how to see through the noise and extract what was relevant,” said



Sirota. "He taught me to think in ways that I never would have learned on my own."

Even after suffering a stroke in 2011, Nelson powered through the physical aftermath. He continued to work with unrelenting purpose and passion. Most recently, he served as project scientist for the planned Thirty Meter Telescope. On June 10, early Saturday morning, Nelson passed away in his sleep at the age of 73. Nelson is survived by his wife, Jocelyn Nelson; his sister Jeanne Moat; two children from his first marriage, Leif and Alexandra; and three grandchildren. His first wife Victoria died in 1992.

Nelson also leaves behind his Keck Observatory ohana, who sorely misses the slipper-wearing, ocean-loving waterman who frequently swam from Mauna Kea Beach to Hapuna Beach during his time on the Big Island of Hawaii.

He inspired everyone in his orbit, as a veteran scientist, mentor, colleague, and personal friend. "Jerry held up the beacon of excellence, showing us that together we could achieve more than we ever dreamed," said Keck Observatory director, Hilton Lewis, who worked shoulder-to-shoulder with Nelson since the early chapters of the Observatory's history.

"We have lost Jerry, but his inspiration and humanity will live on."

About W. M. Keck Observatory

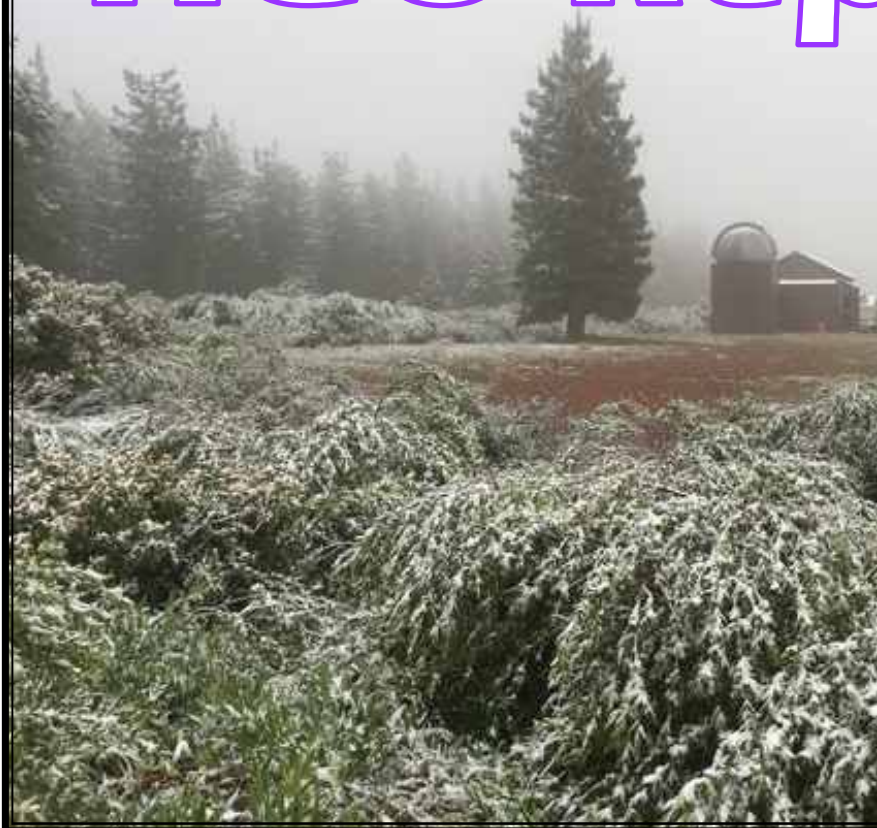
The W. M. Keck Observatory operates the most scientifically productive telescopes on Earth. The two, 10-meter optical/infrared telescopes on the summit of Maunakea on the Island of Hawaii feature a suite of advanced instruments including imagers, multi-object spectrographs, high-resolution spectrographs, integral-field spectrographs, and world-leading laser guide star adaptive optics systems. The Observatory is a private 501(c) 3 non-profit organization and a scientific partnership of the California Institute of Technology, the University of California, and NASA.

Website: <http://www.keckobservatory.org> Reprinted with permission.



HGO Report

Photo by Stuart Schulz
June 11, 2017!



The weather has finally settled down to summer like conditions. Can you believe the above photo was taken in June!

We have a new donated telescope at HGO, a 9.25" Celestron on a CGE mount. It has a Celestron Starsense on board, that will self align quickly. The internal camera takes three photos of the sky, identifies the star patterns, and self aligns! Very Cool! This should be a great addition for our astrophotographers at HGO.

The SVAS Board approved the purchase of new eyepieces and an Android tablet, financed with the insurance payment, to replace the stolen items. We now have a Meade 56mm Plossl, Meade 21mm-100 deg, and a Meade 15mm=100 deg eyepieces. A 32mm Q70 is backordered and will arrive in the next two weeks rounding out the set. Even more reasons to become a Observatory Member!

Newsletter Editor

The Fuzzy Seas of Titan

by Marcus Woo



With clouds, rain, seas, lakes and a nitrogen-filled atmosphere, Saturn's moon Titan appears to be one of the worlds most similar to Earth in the solar system. But it's still alien; its seas and lakes are full not of water but liquid methane and ethane.

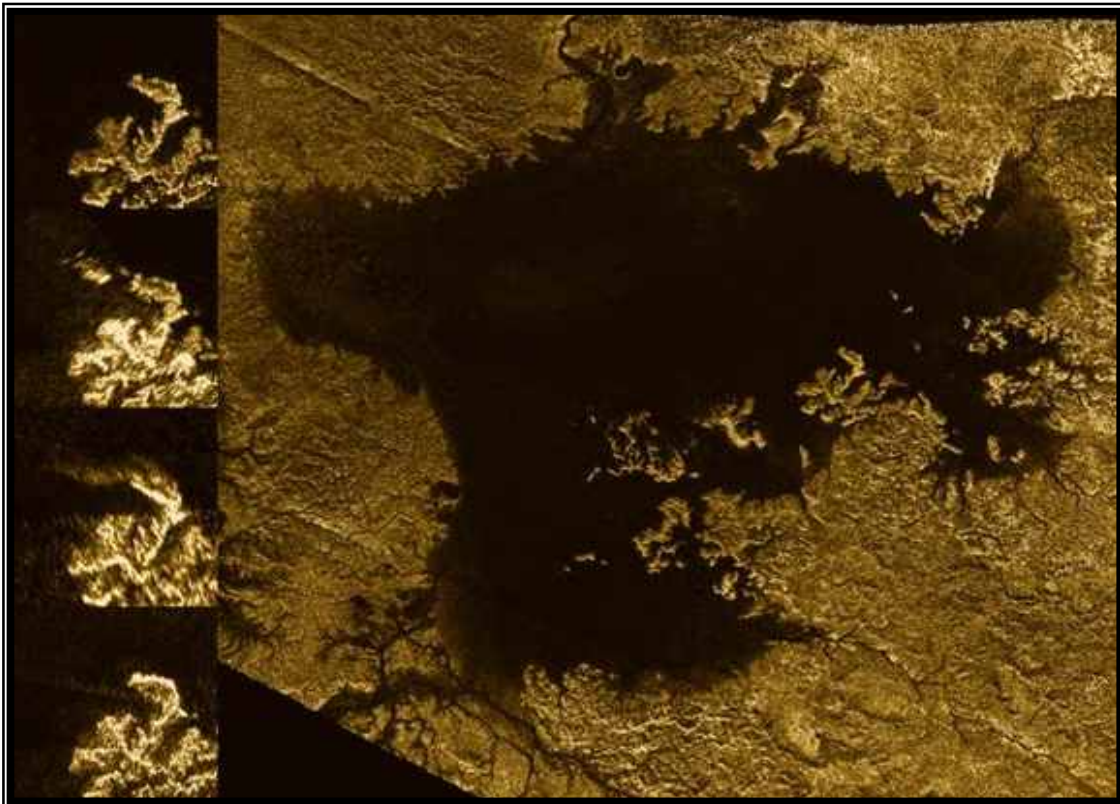
At the temperatures and pressures found on Titan's surface, methane can evaporate and fall back down as rain, just like water on Earth. The methane rain flows into rivers and channels, filling lakes and seas.

Nitrogen makes up a larger portion of the atmosphere on Titan than on Earth. The gas also dissolves in methane, just like carbon dioxide in soda. And similar to when you shake an open soda bottle, disturbing a Titan lake can make the nitrogen bubble out.

But now it turns out the seas and lakes might be fizzier than previously thought. Researchers at NASA's Jet Propulsion Laboratory recently experimented with dissolved nitrogen in mixtures of liquid methane and ethane under a variety of temperatures and pressures that would exist on Titan. They measured how different conditions would trigger nitrogen bubbles. A fizzy lake, they found, would be a common sight.

On Titan, the liquid methane always contains dissolved nitrogen. So when it rains, a methane-nitrogen solution pours into the seas and

lakes, either directly from rain or via stream runoff. But if the lake also contains some ethane—which doesn't dissolve nitrogen as well as methane does—mixing the liquids will force some of the nitrogen out of solution, and the lake will effervesce.



Radar images from Cassini showed a strange island-like feature in one of Titan's hydrocarbon seas that appeared to change over time. One possible explanation for this "magic island" is bubbles. Image credits: NASA/JPL-Caltech/ASI/Cornell

"It will be a big frothy mess," says Michael Malaska of JPL. "It's neat because it makes Earth look really boring by comparison."

Bubbles could also arise from a lake that contains more ethane than methane. The two will normally mix, but a less-dense layer of methane with dissolved nitrogen—from a gentle rain, for example—could settle on top of an ethane layer.

In this case, any disturbance—even a breeze—could mix the methane with dissolved nitrogen and the ethane below. The nitrogen would become less soluble and bubbles of gas would fizz out.

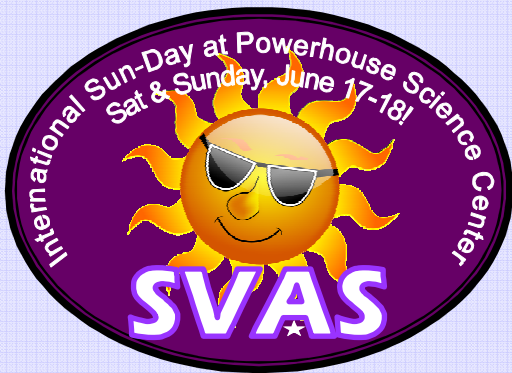
Heat, the researchers found, can also cause nitrogen to bubble out of solution while cold will coax more nitrogen to dissolve. As the seasons and climate change on Titan, the seas and lakes will inhale and exhale nitrogen.

But such warmth-induced bubbles could pose a challenge for future sea-faring spacecraft, which will have an energy source, and thus heat. "You may have this spacecraft sitting there, and it's just going to be fizzing the whole time," Malaska says. "That may actually be a problem for stability control or sampling."

Bubbles might also explain the so-called magic islands discovered by NASA's Cassini spacecraft in the last few years. Radar images revealed island-like features that appear and disappear over time. Scientists still aren't sure what the islands are, but nitrogen bubbles seem increasingly likely.

To know for sure, though, there will have to be a new mission. Cassini is entering its final phase, having finished its last flyby of Titan on April 21. Scientists are already sketching out potential spacecraft—maybe a buoy or even a submarine—to explore Titan's seas, bubbles and all.

SVAS Main Events & Sponsors



SVAS Sponsors!



Classifieds

Large Aperture Aluminum Telescopes with SlipStream GoTo Drive System

These all metal telescopes offer extreme durability, precision of movement, ease of use and a pleasing low profile aerospace look. They feature:

- * Highest quality optics
- * *Feathertouch* focuser
- * Argo Navis DSC's
- * SlipStream Drive with slip clutches on both axes
- * Rigid welded structure
- * Durable powder coating and black anodizing
- * Available in sizes from 16" to 40" and f/ratios from f2.8 to f4.



This is a complete telescope system. It will automatically GoTo and then track any object you bring up on the Argo Navis. Or you can move the scope by hand at any time with no clutches to engage or disengage. A wireless hand control also gives you a 3-speed slew for both axes, allowing you to center objects or do fine guiding. Check our website for pricing and details.

EQUATORIAL PLATFORMS

15736 McQuiston Lane Grass Valley, CA 95945

530-274-9113 tomosy@nccn.net

www.equatorialplatforms.com

For \$ale

Check out
Cloudy Nights Classifieds
for Used Astro Stuff

SVAS Officers

President *Walt Heiges* Vice President *Lonnie Robinson*

Secretary *Kevin Heider* Treasurer *Kevin Normington* Past President *Ross Gorman*

SVAS Board of Directors

~ Even Year Term ~

~ Odd Year Term ~

Tom Braun *Fera Zamani* *Chuck Real* *Charles Jones*
Gary Shuluk *Raj Dixit* *David Macho*

****Please visit SVAS.Org for contact Information****

Committees

Membership / New Members	Walt Heiges / Kevin Normington
Star-B-Q & Resources	Walt Heiges
Yosemite Star Party	Tom Braun
Newsletter Editors	Lonnie Robinson / Walt Heiges
Speaker Seeker	Fera Zamani
SVAS Web Site	Gary Shuluk / Walt Heiges
Public Outreach Director	Walt Heiges
Community Star Parties	Wayne Lord
Observatory Director	Stuart Schulz
Help for Beginners	Lonnie Robinson
Amateur Telescope Making	Lonnie Robinson / Bill Thomas
Scholarships	Chuck Real / Kevin Normington

Where We Meet

General Meetings The third Friday of each month beginning at 8:00pm.

Board Meetings 6:00pm on the same day at JR's BBQ. All members are welcome.

Star Parties On weekends nearest the new Moon.

Sacramento City College
Lily Hall, Room L101
3835 Freeport Boulevard
Sacramento, CA. 95822

SVAS Observer - Newsletter

To Subscribe- First send in your membership application form below, with your dues, and upon approval by the Board of Directors the Observer newsletter (published bi-monthly beginning January) will be sent to your supplied email address in .pdf format. Second, request to join the SVAS Yahoo Group at <http://groups.yahoo.com/group/svas-members>. This group will keep you informed with the day to day current events and discussions.

Articles- Manuscripts and letters are welcome in MS Word, MS Publisher, or plain text format, and emailed to the SVAS Editor. Submission deadline is the 15th of the newsletter release month.

Advertising- Commercial, non-personal advertising, business card, and full page are available. Classified advertising is free to SVAS members.

Copyrights- Except for individually copyrighted articles, permission is granted to other amateur astronomy organizations to reproduce articles in whole or in part, for internal non-profit use, provided credit is given to the SVAS Observer and the authors of the reproduced materials. Copyrighted material appears in this publication solely for non-profit educational and research purposes, in accordance with title 17 U.S.C. section 107.

SVAS Membership Application

Date ___/___/___ Membership (check one) New: ___ or Renew: ___

Annual Renewal Month is June (Expires July 1st)

(Four months minimum membership is requested, please include the following year if necessary)

General Member (Family-Individual)	Prorate @ \$3 per month	\$36 per yr _____
Observatory Member (Please read Observatory Membership)	Prorate @ \$7 per month	\$84 per yr _____ (General Membership included)
Student Member (ID required)	Prorate @ \$2 per month	\$24 per yr _____

Additional Tax Deductible Contribution \$ _____

Total Enclosed Amount \$ _____

Print Name _____

Address _____

City _____ Zip _____

Phone _____ (E-mail required for newsletter mailing)

E-mail _____

Signature _____

Observatory Membership

Observatory Membership offers the benefits of a regular membership plus unsupervised access to Henry Grieb Observatory (HGO), and Robert J. Mathews Observatory (RJMO). **To apply, you must have been a general member for six months or longer, be trained and approved by the Observatory Director, send in your application with the additional dues, and then be approved by the SVAS Board of Directors.**



Please allow 30 Days Or More for Application Approval

By signing this application, I acknowledge I have accessed the SVAS website SVAS.org, read and understand the SVAS bylaws and the rules governing the USFS Special Use Permit. In doing so, I agree to abide by the respective "terms and conditions" of each as they relate to using the SVAS property and facilities. I further understand and acknowledge that failure to abide by these "terms and conditions" can result in revocation of use privileges and/or SVAS membership.

To: SVAS Membership Application
Detach, SIGN, & PO Box 15274
mail with payment. Sacramento, California. 95851-0274