

CONSTELLATION addendum . . .

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Scott Petersen, editor © 2017 BMAA

Congratulations to Vahan

— by *Dwight Dulsky*



BMAA member Vahan Kazandjian earned the rank of Eagle Scout May 24, 2017. Vahan's trail to Eagle began at the same time as his interest in space - in kindergarten. Since then, his interest in space and scouting has skyrocketed.

As a scout, Vahan earned the Space Exploration badge and Astronomy badge. He spearheaded rocket building activities, educated his troop about telescopes and astrophotography, and gained joy working with younger scouts. To capstone his scouting career, Vahan sought to combine his interest in space with his desire to help educate the community and inspire youth.

In deciding on a project, Vahan recalled attending star watches at local parks. As a child, he loved gazing through telescopes provided by Bucks-Mont Astronomy Association (BMAA), an organization he later joined becoming their youngest member. Inspired by the star watches he now participated in as a young astrophotographer, Vahan decided to accentuate this weather dependent community service activity with a permanent exhibit on space that could be found, rain or shine, at the park.

To that end, he designed a Solar System walk which consists of signs about each planet placed at distances to scale in space from the sun. He carefully crafted the signs to engage the entire community, setting them at both a handicap accessible and toddler height. He used language easily understandable to a novice, yet engaging enough for more experienced viewers. For the tech savvy, he included Quick Response (QR) codes which link to additional information. For those less interested in space, he included other challenges: "Light takes eight minutes to get to Earth. How fast can you travel to Earth?" He ensured the longevity of his project by choosing sturdy rust proof materials and aesthetically pleasing additions such as covers for the poles that hold the signs. Vahan also took the time to ensure his project embodied some of the core values in scouting: A Scout is Trustworthy, Loyal, Friendly, Courteous, Helpful, Kind, Thrifty, and Clean.

Next time you are near the Northampton Township Park, be sure to stop by and view Vahan's project. We're sure you will agree it's out of this world!

- *Dwight Dulsky* is co-president of BMAA [-ed]

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Bucks-Mont Astronomical Association, Inc
General Meeting Minutes
May 3, 2017

Location: Upper Dublin Lutheran Church, 411 Susquehanna Road, Ambler PA 19002
Officers present: Gary Sprague and Dwight Dulskey (co-presidents), Ed Radomski (treasurer)
and Robert Mittel-Carey (secretary)

Meeting called to order by Gary Sprague at 7:30p. In attendance: 24 members and guests

- Review of April – May calendar
- Inquired if anyone attended NEAF
- MCCC Observatory update: currently down due to software issues as a result of a planned loss of power. A new course is being added for the Fall semester as well.
- Starwatch at Tyler State Park was canceled due to weather
- Solar demo at Horsham Nature Center went off even with some clouds
- Upcoming solar presentation at Upper Dublin Lutheran Church on 5/10/17
- Reviewed outreach calendar/requests: Upper Dublin Lutheran Church, Southampton Library, and Temple Judea
- Bernie's Observing Challenge for April: no reports
- Show and Tell: Igor had several photos, and a mini-presentation on quasars; very informative and entertaining.
- Dwight gave a quick report on club's Facebook account
- Silent Auction of several donated telescopes
- **Main topic: Telescope Designs – Strengths and Weaknesses**
Dwight Dulskey gave a clear and well-presented explanation of the common designs of telescopes, and the pros and cons of each.

Respectfully submitted,
Robert Mittel-Carey, BMAA secretary

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May 2017

The Fizzy 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.

"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.

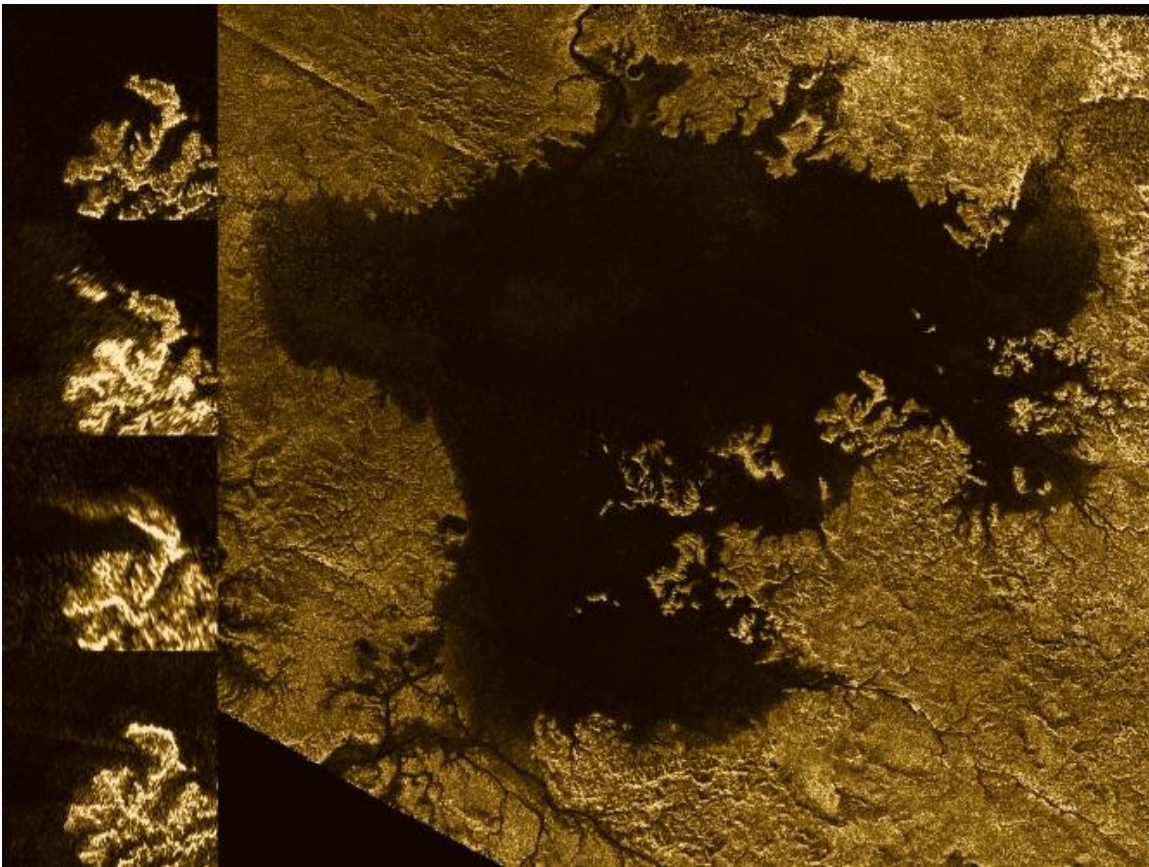
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But such warmth-induced bubbles could pose a challenge for future sea-faring spacecraft, which will have an energy source, and thus heat. "You may have this spacecraft sitting there, and it's just going to be fizzing the whole time," Malaska says.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

To teach kids about the extreme conditions on Titan and other planets and moons, visit the NASA Space Place: <https://spaceplace.nasa.gov/planet-weather/>



Caption: 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

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

Visit **spaceplace.nasa.gov** to explore space and Earth science!

- Space Place is provided by NASA to amateur astronomy clubs [-ed]

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