New Braunfels Astronomy Club

Larry’s Celestial Calendar & Newsletter
- 317th Edition
Volume 26, Number 12
December 20th, 2023 to January 17th 2024

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Lagniappe

Cover Story> Where There’s Methyl...
December 20th, 2023
TPML at 6:00 pm
Meeting 291

Agenda

- Open meeting and introduce new members (get names, email).
- Interesting observations, experiences. **TONIGHT AT 06:18!** THE ISS SKIRTS LOW ABOVE THE HORIZON FROM CAPRICORNUS (WSW) TO URSA MAJOR (NNE). SEE THE ISS SCHEDULE.
- Show and tell.
- Current news and what’s in our sky this month: *Member input, Newsletter.*
- Events, Outreach, Planning.
  - Dedication of the Keyser-Stevens telescope at the January 13th Astronomy Night
- **Main Event**
  - Steve Ellery on Imaging: Advances in Post Processing

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**New Braunfels Astronomy Club**

Because It's Out There

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**Comming up:** OUR 292nd ASTRONOMY CLUB MEETING

January 17th, 2024, from 6 - 8 pm
Tye Preston Memorial Library, Canyon Lake

Library website: tpmi.org
NBAC website: astronomynbtx.org
NBAC Email: admin@astronomynbtx.org

Astronomy Friends New Braunfels.................... facebook.com/groups/354953995432792/
Comal County Friends of the Night Sky............. facebook.com/groups/166098014710276/comaldarksy.org/ Email: admin@comaldarksky.org
NEWS TO CHEW ON

Eris Could Be Slushier Than Pluto

From: Universe Today

In 2005, astronomer Mike Brown and his colleagues Chad Trujillo and David Rabinowitz announced the discovery of a previously unknown planetoid in the Kuiper Belt beyond Neptune’s orbit. The team named this object Eris after the Greek personification of strife and discord, which was assigned by the IAU a year later. Along with Haumea and Makemake, which they similarly observed in 2004 and 2005 (respectively), this object led to the “Great Planet Debate,” which continues to this day. Meanwhile, astronomers have continued to study the Trans-Neptunian region to learn more about these objects.

While subsequent observations have allowed astronomers to get a better idea of Eris’ size and mass, there are many unresolved questions about the structure of this “dwarf planet” and how it compares to Pluto. In a recent study, Mike Brown and University of California Santa Cruz professor Francis Nimmo presented a series of models based on new mass estimates for Eris’ moon Dysnomia. According to their results, Eris is likely differentiated into a convecting icy shell and rocky core, which sets it apart from Pluto’s conductive shell.

Astronomers can use the spin and orbital characteristics of planets and their moons to infer certain properties, like their internal structures. But until recently, scientists did not have estimates on Dysnomia’s size, mass, and density. Luckily, Brown and his colleague Bryan J. Butler – a researcher at the National Radio Astronomy Observatory (NRAO) – recently conducted observations of Dysnomia and Eris (and Orcus and its satellite Vanth) using the Atacama Large Millimeter-submillimeter Array (ALMA). Based on their findings, published in The Planetary Science Journal, Dysnomia has a diameter of about 615 km (382 mi) and Dysnomia and Eris have a mass ratio of 0.0085.

This upper mass limit provided the second crucial piece of information, which concerned Eris’ internal structure. The main result of Brown and Nimmo’s model (but did not expect) is that Eris is surprisingly dissipative, a concept in thermodynamics where a system operates out of equilibrium. From this, they determined that Eris has a rocky core surrounded by a layer of ice and a crust that is likely convecting. “The rock contains radioactive elements, and those produce heat,” Nimmo said. “And then that heat has to get out somehow. So as the heat escapes, it drives this slow churning in the ice.”

Comet-Asteroid Chiron Has Rings

From: Sky & Telescope

Chiron is weird. When found in 1977, it was the farthest minor planet known at the time. Its unusual orbit between Saturn and Uranus made it the first of a new class of solar system objects: the Centaurs. Around 1,000 Centaurs are known today, but Chiron remains special: In 2011, astronomers spotted a possible ring system around it. Now, with two new recently published studies, it has become clear that this system is undergoing some dramatic changes.

The newest observations seen to indicate that the rings have grown in number, from two to three.

Chiron has long been known to be an oddball. It is one of the few small solar system bodies with a double personality. Originally classified as an asteroid (2060 Chiron), it also shows behavior more akin to a comet. In addition to the variable water in its spectra, it also produces jet-like dust structures, found during the 1993-1994 occultations. That’s why Chiron also bears a comet’s designation, 95P/Chiron.
# Astronomy Night at Tye Preston Memorial Library

**Canyon Lake, TX**

<table>
<thead>
<tr>
<th>Date</th>
<th>Doors Open</th>
<th>Moon Phase/Note</th>
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<tbody>
<tr>
<td>1/13/24</td>
<td>6:00 PM</td>
<td>2 days past N</td>
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<tr>
<td>2/10/24</td>
<td>6:30 PM</td>
<td>1 day past N</td>
</tr>
<tr>
<td>3/9/24</td>
<td>7:00 PM</td>
<td>1 day before N</td>
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</table>
| 4/8/24   | 12:00 PM   | Sun Party—Total Solar Eclipse: Wear Sunscreen  
Partial Start: 12:15pm  
Totality Start: 1:35pm (2 min, 14 seconds duration)  
Partial End: 2:56pm |
| 5/11/24  | 2:00 PM    | Sun Party—wear sunscreen         |
| **June, July, August** |          | No Scheduled Astronomy Nights    |
| 9/14/24  | 8:00 PM    | 1st Q: International Observe the Moon Night  
4 days before N |
| 9/28/24  | 7:30 PM    | 2 days past last Q               |
| 10/26/24 | 7:00 PM    | 1 day before N                   |
| 11/30/24 | 6:00 PM    | 1 day before last Q: --Winter Solstice-- |
| 12/21/2024 | 6:00 PM | 1 day before last Q: --Winter Solstice-- |

Tye Preston Memorial Library  
New Braunfels Astronomy Club  
[tpml.org](http://tpml.org)  
[astronomynbtx.org](http://astronomynbtx.org)  
[Facebook](https://www.facebook.com/AstronomyFriendsNewBraunfels)  

There will be surprise giveaways at some events so join us!!

Comal County Friends of the Night Sky supports and encourages Astronomy Night  
Website: comaldarksky.org  
Email: info@comaldarksky.org  
[Facebook](https://www.facebook.com/ComalCountyFriendsoftheNightSkyGroup)
<table>
<thead>
<tr>
<th>SUN</th>
<th>MON</th>
<th>TUE</th>
<th>WED</th>
<th>THU</th>
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<td>DEC 20</td>
<td>21</td>
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<td>23</td>
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<td></td>
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<td></td>
<td>NBAC Meeting 6:00 TYE PRESTON MEMORIAL LIBRARY, CANYON LAKE</td>
<td>WINTER SOLSTICE THE LONG NIGHT</td>
<td>Winter begins at 9:27pm CST</td>
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On the Cover: Did Earth come to be inside a molecular cloud similar to Orion’s M42? Maybe. The presence of Methyl cations (CH₃⁺) in M42 is encouraging evidence that the organic molecules necessary for life are present.

25 26 27 28 29 30

24 25 26 27 28 29 30

Merry Christmas

Jan 01 02 03 04 05

Jan 07 08 09 10 11 12 13

Astronomy Night at TPML 6:30pm
Dedication of the Keyser-Stevens Telescope 5:30pm

14 15 16 17 18 19 20

NBAC Meeting 6:00 TYE PRESTON MEMORIAL LIBRARY, CANYON LAKE
Solar System Happenings

The Sun is ramping activity as solar maximum approaches. New estimates predict a 2024 peak.

Mercury is out of sight in mid-December, heading for inferior conjunction with the Sun on December 22. It emerges as a morning planet in January, slowly drifting in the sky toward Venus until they appear 11° apart on January 17th.

Venus is still brilliant in the morning but receding from us.

Earth still spins, and we are still here to marvel at it all.

Best ISS viewing for Canyon Lake/New Braunfels – From Heavens Above

<table>
<thead>
<tr>
<th>Date</th>
<th>Start Time</th>
<th>Start Loc</th>
<th>Max Alt °</th>
<th>End Loc</th>
<th>Note</th>
</tr>
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<tbody>
<tr>
<td>01/03</td>
<td>06:45:09</td>
<td>NNW</td>
<td>23</td>
<td>ESE</td>
<td>Exits Earth’s shadow at start time. Comes close to Vega (Lyra)</td>
</tr>
<tr>
<td>01/05</td>
<td>06:44:08</td>
<td>NW</td>
<td>81</td>
<td>SE</td>
<td>Exits Earth’s shadow at start time. Comes close to M97 (Ursa Major). Comes close to Venus</td>
</tr>
<tr>
<td>01/13</td>
<td>18:23</td>
<td>SSW</td>
<td>29</td>
<td>ENE</td>
<td>Close to Betelgeuse (Orion). Enters Earth’s shadow at End, in Gemini.</td>
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<tr>
<td>01/15</td>
<td>18:21</td>
<td>SW</td>
<td>69</td>
<td>NE</td>
<td>West of Saturn. Enters Earth’s shadow at End, about 10 degrees from the NE horizon.</td>
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<tr>
<td>01/17</td>
<td>18:18</td>
<td>WSW</td>
<td>21</td>
<td>NNE</td>
<td>Close to delta Cygni. Enters Earth’s shadow at end, &lt; 5 degrees from the NNE horizon, in Ursa Major</td>
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Quadrantid meteor shower

January 4th
1 am and later – looking northeast
The Moon dances with planets and stars.
Mars is lost in the Sun’s glare until later in January.
Jupiter is well placed and looking good.
Saturn is in the west and setting early so catch it before it’s gone!
Uranus is in Aries, in a retrograde path. It is magnitude 5.7 and lies about midway between Jupiter and the Pleiades (M45).

Neptune is at its best, magnitude 7.7, residing in Pisces.
Comets:

- Comet 62P/Tsuchinshan 1 (say that fast 5 times) is a short-period comet of 6.5 years and gracing the early AM sky (stay up past 1am), with its 10th magnitude charm. Discovered in 1965 at Purple Mountain Observatory, Nanking.
Comet 12P/Pons-Brooks is a short-period comet, returning to our neighborhood every 71 years. This comet’s name is a case of poor record keeping. Jean-Louis Pons discovered it in 1812 but had its positions wrong. It was re-discovered in 1883 by William Brooks, recognized later as the same comet Pons found. This comet has been known to have outbursts – reaching naked eye brightness.

My Celestial Pick: Cassiopeia

Our Queen of the Night, Cassiopeia offers some good viewing, with numerous open clusters, subtle nebulae, and dim galaxies. My favorite, NGC 7789, Caroline’s Rose, is a large open cluster that can, in 10” and larger telescope, resemble a pattern of rose petals.

Check it out.
Cover Story> Where There’s (CH$_3^+$)

So, where there’s water and salt, we might find life. They were two newsletter cover stories.

Next up...organics. Life on Earth is organic, we don’t know of any fully inorganic life forms. We just have what Earth has provided. So, our best bet is to look for those molecules that we can be confident are associated with life. Water and salt are two important substrates. But, finding organic molecules along with water and salt brings us closer to the holy grail of life. The basic building block of organic molecules is the Methyl cation (CH$_3^+$), so, finding it in places like molecular hydrogen clouds, M42 for example, gives astrobiologists heart palpitations! The Methyl cation is a ubiquitous building block of complex organic molecules on Earth...and in life on Earth.

The James Webb Space Telescope has done just that! Astronomers used it to look at a protoplanetary disk (d203-506) around a dim, red dwarf star in M42 and detected methyl cations. They are being produced by intense ultraviolet light coming from the nearby Trapezium cluster of young, hot stars, which also unfortunately breaks apart water molecules. Other observations with JWST have turned up water in protoplanetary disks farther away from the Trapezium stars. So, it’s just a matter of time before astronomers find a protoplanetary disk with water, salt, and methyl cations.

Then wait a few billion years.

Eric Erickson
CARPE DIEM

Yeah, we got a 3-14 here. Cryosleep at the wheel.

CARPE DIEM

My dog's home all alone and... Yup, I can see the tears in his eyes as he gazes out the window.