



# Carpe Noctem



## The News of Central Texas Astronomical Society

September-October 2016

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**President: Aubrey Brickhouse**

**Editor: Kent Swarts**

### CTAS Elections & Member Meeting

Next Tuesday Oct. 18th at 6:30pm is an important meeting for our astronomy club. We will be having the annual recommendation from the Nominating Committee for Officers and Directors to serve the club for the fiscal year of 2017. Dean Chandler, Bernard Ott and Johnny Barton serve on the committee this year and we appreciate their effort. Candidates will be announced at the meeting.

We will then have an excellent program from Brad Walter from Lockhart, TX on the AAVSO program. This organization has been around from the earlier days of Harvard's venture into Astronomy. Since its founding in 1911, the **American Association of Variable Star Observers (AAVSO)** has coordinated, collected, evaluated, analyzed, published, and archived observations made largely by amateurs and makes the records available to professional researchers, and educators. These records establish the variation in brightness of a star over time.

We will be meeting at the Feed Mill in Gatesville. It is located on 7th street. Just go through most of Gatesville on 84 and hang a right on 7th street and look for two old tall feed tanks. You may enjoy a good meal or just come for dessert or coffee or nothing but fellowship.

### On Four of Our Solar System's Moons

*Edited By: Kent Swarts*

#### **The Moon's Continuous Facelift**

*By: Emerson Speyerer, Arizona State University*

The Moon is bombarded by so much space rock that its surface gets a complete facelift every 81,000 years, according to a study released Wednesday based on NASA data.

This churn, affecting the top inch of mostly loose moon dust, happens 100 times more frequently than previously thought, scientists reported.



The study also estimates that asteroids and comets crashing into Earth's only natural satellite create, on average, 180 new craters every year.

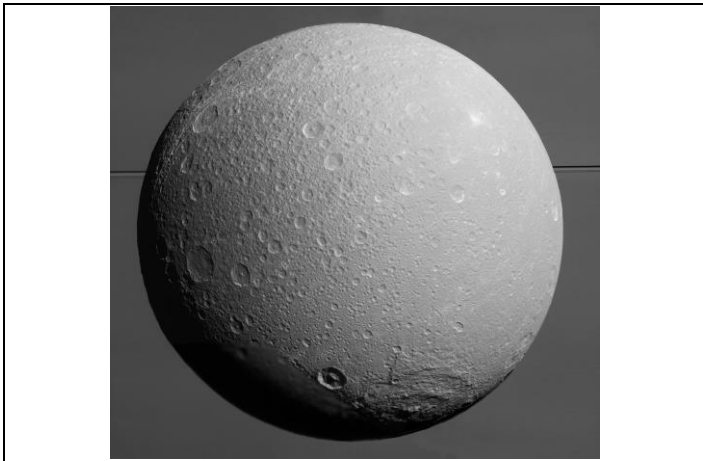
The findings, published in *Nature*, come from "before and after" pictures taken by NASA's Lunar Reconnaissance Orbiter spacecraft, which has been mapping the Moon since 2009. By comparing images of the same area at regular intervals, a team of scientists led by Emerson Speyerer from Arizona State University in Tempe were able to tally the

number of new craters and extrapolate to the entire surface of the Moon.

### **Saturn's New Oceanic Moon, Dione**

*By: Researchers of the Royal Observatory of Belgium*

A subsurface ocean lies deep within Saturn's moon Dione, according to new data from the Cassini mission to Saturn. Two other moons of Saturn, Titan and Enceladus, are already known to hide global oceans beneath their icy crusts, but a new study suggests an ocean exists on Dione as well.



Researchers of the Royal Observatory show gravity data from recent Cassini flybys can be explained if Dione's crust floats on an ocean located 100 kilometers below the surface. The ocean is several tens of kilometers deep and surrounds a large rocky core. Seen from within, Dione is very similar to its smaller but more famous neighbor Enceladus, whose south polar region spurts huge jets of water vapor into space. Dione seems to be quiet now, but its broken surface bears witness of a more tumultuous past.

Dione's ocean has probably survived for the whole history of the moon, and thus offers a long-lived habitable zone for microbial life. "The contact between the ocean and the rocky core is crucial", said Attilio Rivoldini, co-author of the study. "Rock-water interactions provide key nutrients and a source of energy, both being essential ingredients for life."

### **NASA Discovers A Moon at Makemake**

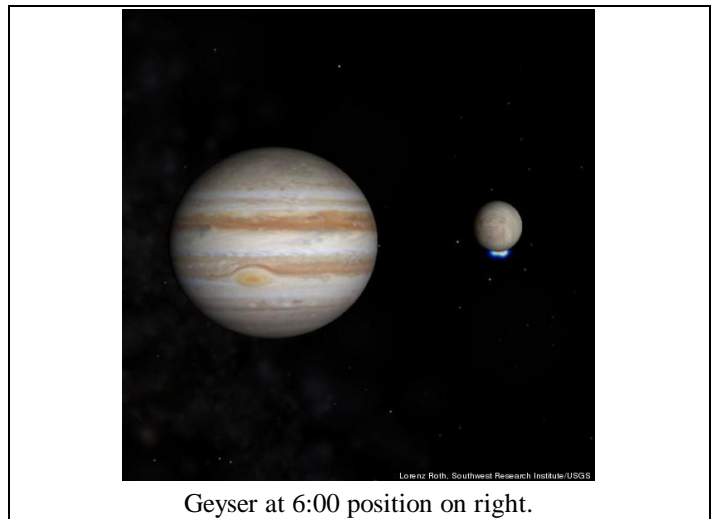
Using the Hubble Space Telescope, scientists have discovered a new moon in our solar system, orbiting the distant dwarf planet (planetoid) called Makemake. The tiny moon is estimated to be only

about 100 miles across, and Makemake, the dwarf planet it orbits, is just 870 miles wide.



### **Jupiter's Moon Europa Has Water Geysers Taller Than Everest, Hubble Images Suggest**

*By: Hubblesite*



Geyser at 6:00 position on right.

Europa is about the size of Earth's moon. Beneath an icy crust maybe 10 to 15 miles thick, investigators think Europa possesses a giant, churning ocean perhaps up to 100 miles (160 km) deep. Since there is life virtually wherever there is water on Earth, researchers have long wondered if Europa could support life.

### **President's Letter for Carpe Noctem**

September-October 2016

CTAS has many new members, many members who have been around since the beginnings of CTAS, and the rest of us in between. It is disappointing for the new members to not see any of the veterans out on the field at Meyer's at the Membership Star Parties. They are anxious to learn the night sky and learn to find objects with either their binoculars or a new telescope. But what do they find?

Attendance at Member Star Parties is low except during the Star B-ques. Most months, we

have new members that come to learn the night sky and about telescopes and how to use various types. To teach them, we rely on our experienced members. It is part of CTAS' Outreach. Plus, the comradeship gained by all is a tremendous asset to each individual and the club. Without your time and effort, new members lose interest and become inactive. However, the future of CTAS is in our new members, so we need to be supportive of them. Come out! Seize the night and help a newbie.

So do not let our club become only a "fair weather" club whose members' only show up for "perfect" viewing. It also would encourage all to see the officers and directors make a habit of coming to these programs specifically to get to know the members of the club.

We are hoping to make further progress this quarter in framing the agreement with Peter Mack to upgrade our 24" Telescope. It was his first telescope built and so we are a little behind with technology from the late 1990's. Dean has been out of town a lot and Peter has been out of country working on new installations.

We have one more opportunity this year to go to an excellent Star Party and that is the Eldorado Star Party outside Eldorado, TX starting on Oct. 24 and running to Oct. 30<sup>th</sup>.



These fall star parties are great because you can start viewing real early and get in a lot of viewing or imaging and still get a reasonable night's sleep. The 11<sup>th</sup> Oct. is the last day to register at web prices. Here is the link: <http://eldoradostarparty.org/>

Thanks for your support and hope to see you at the next event.

**Keep looking up!**

*Aubrey Brickhouse*

*President*

**CTAS 20 YEARS AGO (1996): (Summarized by your President from old issues)**

**Carpe Noctem October 1996 Volume III, No. 10**

The President of McLennan County Astronomy Club was Mike Green and Vice President was Mike Robinson with Secretary Johnny Barton. Dick Campbell was the editor. The main article was a discussion of the request for amateurs to observe Saturn to map several bright spots in the south equatorial belt. Also there was an interesting discussion of Film Photography at Prime focus and the discovery of a company (Seattle Film Works) that provided special film and processing. A picture was shown by Dick Campbell of the Gibbous Moon on a Meade LX 6 and a 35mm camera to demonstrate the results of the special film.

**CTAS 10 YEARS AGO (2006): (Summarized by your President from old issues)**

**Carpe Noctem September 2006 Volume XIII, No. 9**

The Lake Whitney Star-B-Que was held on Saturday, August 18th at Lake Whitney State Park. The event was co-hosted by Central Texas Astronomical Association and Lake Whitney Astronomical Association. Over 30 members of CTAS participated in this annual event. Several CTAS members were lucky recipients of the myriad door prizes. Aubrey Brickhouse won the grand prize: a beautiful framed photograph of the sunset during various seasons of the year. Very informative presentations were made by several CTAS members. John McAnally informed the crowd of the significant changes observed in the planet Jupiter in recent years. Fergal Mullally talked about white dwarf stars and the research being conducted through the University of Texas in conjunction with Turner Research Station using the Meyer Observatory along with the McDonald Observatory.

Paul Derrick announced that his course "Learning the Night Sky" will start on Oct.9 and run for four sessions. It was free for members and many people took the course.

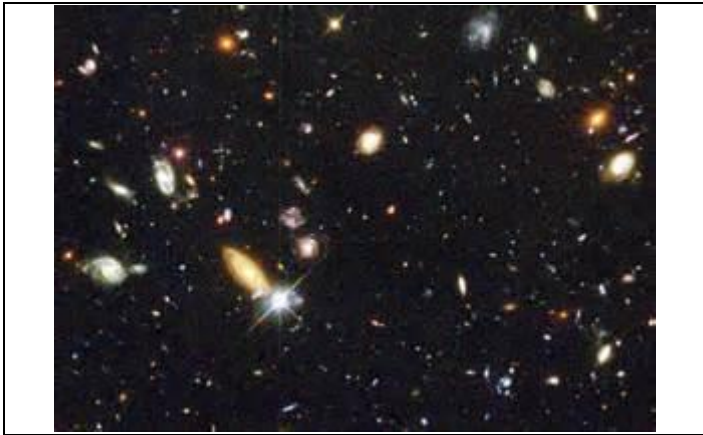
**Trillion of Galaxies**

*By: Christopher Conelice, University of Nottingham, UK*

One of the most fundamental questions in astronomy is how many galaxies the Universe contains. The Hubble Deep Field images, captured in

the mid 1990s, gave insight into this. Myriad faint galaxies were revealed, and astronomers estimated that the observable Universe contains about 100 billion galaxies. Now, an international team, led by Christopher Conselice from the University of Nottingham, UK, have shown that this figure is at least ten times too low.

Conselice and his team reached this conclusion using deep space images from Hubble, data from his team's previous work, and other published data. They painstakingly converted the images into 3-D, in order to make accurate measurements of the number of galaxies at different times in the Universe's history.



In addition, they used new mathematical models that allowed them to infer the existence of galaxies, which the current generation of telescopes cannot observe. This led to the realization that in order for the numbers to tally with the data some 90% of the galaxies in the observable Universe are actually too faint and too far away to be seen. It boggles the mind that over 90% of the galaxies in the Universe have yet to be studied.

A decreasing number of galaxies as time progresses from the Big Bang contributes to the solution of Olbers' paradox (see below). The team came to the conclusion that there is such an abundance of galaxies that, in principle, every point in the sky contains part of a galaxy. However, most of these galaxies are invisible to the human eye and even to modern telescopes, owing to a combination of factors: redshifting of light, the Universe's dynamic nature, and the absorption of light by intergalactic dust and gas. These combine to ensure that the night sky remains mostly dark.

(Olber's Paradox: If the universe is static and populated by a nearly infinite number of [stars](#), then any sight line from [Earth](#) must end at the (very

bright) surface of a star, so the night sky should be completely bright.)

## Astrophotography

### An amazing month of photos.

By: *Jeffrey McClure*

I have attached three images of NGC 2264 and surrounding areas. IMG\_1: Full Spectrum is the best I was able to get using full spectrum light in 2014. IMG\_2: Sepia is a back yard image of pure hydrogen-alpha with a sepia tone made in February of this year. NGC 2264 Hubble Pallet is just that, made this year from my back yard.



ImG\_1: Full Spectrum



IMG\_2: Sepia



NGC 2264 Hubble Pallet

**M33: Triangulum Galaxy**

*By: Aubrey Brickhouse*



**Star Parties:**

<b>Member Star Party:</b>	<b>Oct. 29</b>
<b>Observatory Open House:</b>	<b>Nov. 5</b>
<b>Public Star Parties:</b>	<b>Nov. 5</b>

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