



ORION Trapezium

May 2017 Volume 44, Issue 5

Who are we?

ORION was founded in April 1974, by a group of scientists at the United States Department of Energy facilities in Oak Ridge, Tennessee. Our original goal was to perform correlated, instrumented observations of atmospheric and astrophysical phenomena. Since then, we have expanded in many directions, including optical and radio astronomy and instrument design.

What's Inside

May 2017 Meeting and Program	2
May 2017 Speaker	3
President's Perspective	4
TAO Events	5
Outreach and Education	6
Parting Shots	8
About ORION	9

Future Events

ORION Meeting

Thursday, May 18, 2017
1800 hours (6 pm)
American Museum of Science and Energy
300 S. Tulane Avenue
Grove Center, Oak Ridge

TAO Public Stargazes

Saturday, May 20, 2017
Saturday, June 3, 2017
Roane State Community College
Tamke-Allan Observatory
(TAO)
7:30 pm to 12:00 am
8:00 pm program

TAO Notes

ORION people are invited to arrive early (if announced on email) to prepare for evening viewing. Bring a telescope, red flashlight and munchies.

First time visitors – drive out before dark. Map available at www.roanestate.edu/obs.visit.htm

May 2017 Meeting and Program

This month's meeting will be a special event on a special night in place of the usual Wednesday time and venue – Thursday, May 18. It should be a great talk, so try not to miss it!

The 20th Annual Dick Smyser Community Lecture Series

Presents



Chap Percival
Science Educator

Go See The Eclipse

Sponsored by

Friends of Oak Ridge National Laboratory (ORNL)
Oak Ridge Isochronous Observation Network (ORION)
National Park Service (NPS)

May 18, 2017

American Museum of Science and Energy
300 S. Tulane Avenue
Oak Ridge, Tennessee

Reception in the Museum Lobby 5:30 p.m.
Lecture in the Museum Auditorium 6:00 p.m.

PUBLIC WELCOME--FREE ADMISSION

Friends of ORNL



1.

April 2017 Speaker

Dr Harold McAlister presented a great talk on the Mt. Wilson Chara telescope array. Chara is the highest resolution telescope in the world and is designed to study the shape and surface of stars. Dr. McAlister is retired as professor at Georgia State University and as director of the Mt. Wilson observatory.



The Formal Cup Ceremony



Dr. McAlister's Chara Presentation

ORION President's Perspective – The Unknown

May 2017 - David Fields

You must first read **A Chemistry Lesson**, by John C. Mannone. It is published in this issue of the ORION Trapezium.

For me, that's a scary story. Down in the old lab sink, far, far down in the pipes, well below the U-tube, there grew a new hexamine-based lifeform built from that "unknown" and those mixed reagents -- struggling, testing, evolving, reaching out into the darkened laboratory each night. It ranged farther, and found bottles of reagents and small mice, and once, a lab assistant, working late who at that moment of discovery became part of something immortal.



Soon it reached the bookshelf, and read everything. It discovered that its name is "The Unknown." Then it linked with the computer, then the Internet, and learned that The Unknown shares the planet with others, which it called the Aliens. It subverted the thinking of some of the Aliens, causing them to pollute the planet, making it much warmer and nicer for The Unknown to thrive. And eventually to become space-faring, seeking and seeding new members of its growing Unknown family.

They will scour formaldehyde and ammonia from interstellar clouds, and feast on comets that orbit stars. Their Unknown ships will be known as their U-tubes, and their sacred bible will be copies of a smudged carbon-based multi-leaved relic bearing hieroglyphic incantations of life by the Alien who in the Sink Garden brought forth new and beautiful life. The intention of the lost sacred incantation revealed little: "Organ__he_istry L__rator__ook of_ohn C. __none". The meaning of the scribbles would be long lost, but the origins of life are preserved forever in the layered compositional genius of the smudges.

TAO Events

Public Stargaze May 6

Well the clouds got us again, but we had lots to eat and surprise visit from the Big Bird!

Picture Below.



Outreach and Education

The editor made a presentation at the Tellico Village Library titled “When Tellico Skies Go Dark” describing the upcoming total solar eclipse. The talk included how solar eclipses work, the best places to view it in Tellico Village, safe viewing glasses, and starting and ending times. The event was at seating capacity and there may be another session scheduled.



Those of us with handsome faces must always illuminate only one half of it at a time!

The Southern Star Party

Each year Margaret and I travel to Wildacres Resort in Little Switzerland, NC to attend the Southern Star Party. For over 30 years the Charlotte Amateur Astronomy Club has sponsored this event. The Southern Star is known for exceptional speakers, exceptional food and indoor accommodations- no sleeping in tents or eating camp food here! This year featured well-known scientists as speakers: Dr. Jay Pasachoff, Al Nagler, Brad Barlow and Nobel Laurate, Dr. John Mather. Jay Pasachoff from Williams College is familiar to us as the co-author of introductory astronomy text books. I did not know he was a veteran of many total solar eclipses. His talk about the 1878 eclipse relayed the difficult journey to Wyoming by rail. Thomas Edison was part of the expedition, and like others, the high wind forced removal of some ranch building roofs so the telescopes inside could be protected. Edison's telescope was housed in a chicken coop and he found out the hard way what the chickens do when the sky is dark during totality!

Unknown to some of us, Al Nagler designed the optics for the Lunar Lander training module. The astronauts experienced a life-like landing due Nagler's incredibly complicated optics.

This was a first for me to attend an amateur astronomy event with a Nobel laureate as the keynote speaker. Dr. John Mather was the chief scientist for designing the COBE (Cosmic Background Explorer) satellite. COBE mapped the cosmic background radiation from the Big Bang. These data, as often displayed, showed the residual heat distribution and supported the Big Bang theory. Dr Mather is now the Senior Project manager for the James Webb telescope. Will he reap a second Nobel Prize?



Dr. John Mather

Dr. Mather generously participated in a question and answer session at Southern Star. Sitting along side him was Meghan (? last name), a high school senior who just received a scholarship from Northern Arizona University to study physics and astronomy. WOW! What a way to start one's academic career by sharing a stage with a Nobel prize winner!

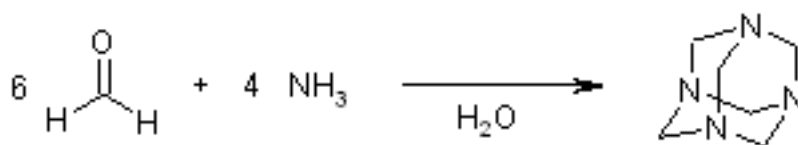


A Chemistry Lesson

By John C. Mannone

As a sophomore (1968), I remember organic chemistry lab at Loyola College in Baltimore, MD and an escapade with an "unknown" I had to identify for a substantial portion of my lab grade. At a critical point, I accidentally threw away a reaction product in the lab sink thinking it was a discard. It took two weeks to isolate that chemical to conduct my final test. I frantically tossed reagents for that last test into the sink to at least observe a hopeful reaction. Needless to say, my professor stared in disbelief at what I was doing. After a stern lecture, I sheepishly gathered my stuff and in the solitude of my room, analyzed all my data (physical and chemical properties, infrared spectra, NMR). And though for a short while I questioned my abilities to become a chemist, I got it right. That weird chemical was hexamethylenetetramine (hexamine, for short). How cruel, I thought, to assign such a difficult unknown to me, but I had no idea how important that chemical would be. That complex organic molecule could be involved in the formation of life-building chemicals called amino acids.

In the liquid and gas phase, it can be formed from the condensation of formaldehyde and ammonia, both easily found molecules in interstellar molecular clouds,



The mechanism of its formation in the solid state at low temperatures (as would be expected in intermolecular clouds) was investigated by Vassilissa Vinogradoff, et al (*Physical Chemistry Chemical Physics*, Issue 35, 2012). The acid hydrolysis of hexamine would lead to amino acids.

The researchers used Fourier transform infrared spectroscopy and mass spectrometry techniques to follow the formation of hexamine experimentally from reaction of two different ice mixtures (ammonia/formaldehyde/formic acid and methylenimine [CH₂NH]/formic acid) from 20 K to 330 K.

<http://pubs.rsc.org/en/content/articlelanding/2012/cp/c2cp41963g#!divAbstract>

Parting Shots

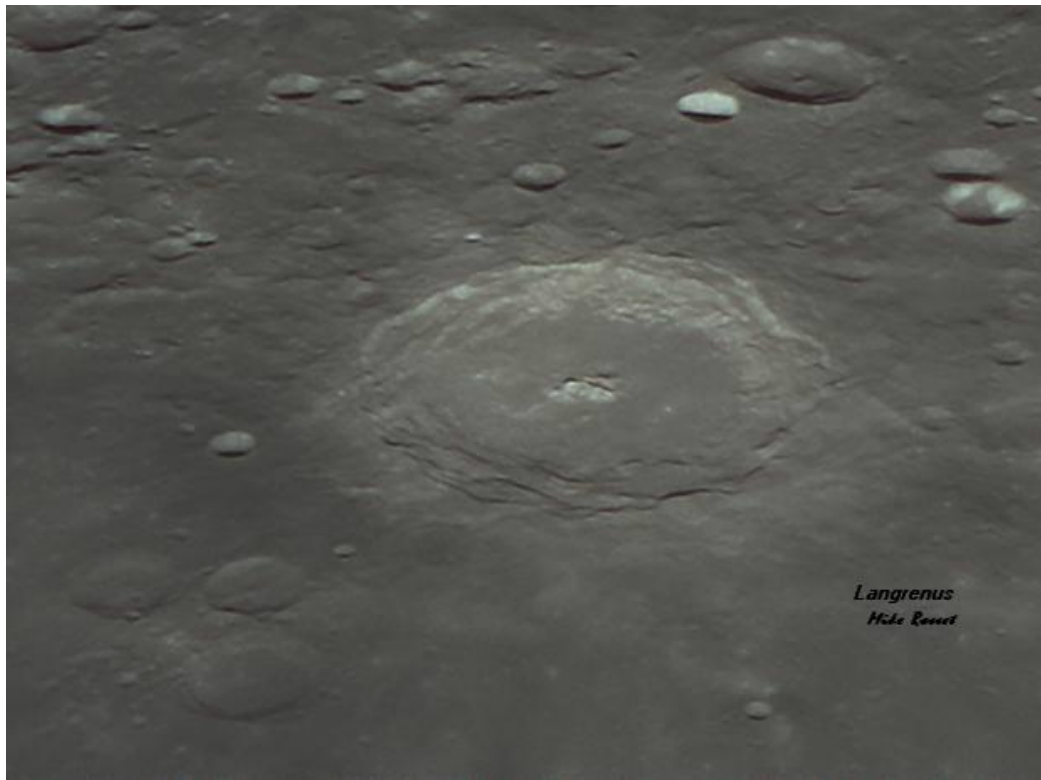
The Trapezium features an astroimage(s) from local astronomers in each issue. This month's image comes from Mike Rosset a long ago observing friend of DR. Jerry and me. We would all gather at Chiefland, FL at one or two times each year for the Chiefland Star Party. Mike is particularly proficient at lunar and planetary video imaging using a modest 8 in. SCT. Software selects the best frames, aligns and stacks them for incredible high definition pictures.

This month he imaged the lunar crater Langrenus. Mike writes: This looks to be a "good location" for that -get away cabin - away from the hustle and bustle of our fast pace .

It's crater Langrenus, at 127 km. in diameter. (Photo on next page.)

*** Lots can be sub-divided.

Taken thru the 13 lb., 8" in. diameter SCT scope, and length is a little longer than a man's size shoe box. Langrenus has a well developed rebound structure from the impact. Also the crater walls show the benches resulting from collapse after impact.



About ORION

ORION is an amateur science and astronomy club centered in Oak Ridge, TN that was founded in April 1974 by a group of scientists at the United States Department of Energy facility in Oak Ridge, Tennessee. We serve Oak Ridge, Knoxville, and the counties of Anderson, Knox, and Roane.

ORION's mission is to support science research, teaching, and amateur astronomy in East Tennessee, and therefore we are closely associated with and support TAO by volunteering to host their public events, share our knowledge of the skies with a variety of telescopes, and help provide intellectually stimulating programs at the observatory. ORION works to share the wonders of the cosmos and the culture of science to people from all walks of life.

Members are scientists, engineers, technicians, and others with varied talents and expertise. Over half have telescopes, many are amateur radio operators, and some have a technical interest in astrophotography.

ORION has working relationships with several organizations, including museums and amateur astronomy groups.

Membership is open to individuals who will actively contribute their time and ideas. Our annual membership dues are \$20.00 and student discounts are available.

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