



ORION Trapezium

October 2017 Volume 44, Issue 10

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. Have a look at <https://orioninc.org> and <https://orionastronomy.wordpress.com/meetings/upcoming-meetings/>

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Future Events

ORION Meeting

Wednesday, October 18, 2017
1900 hours (7 pm)
Goff Health Sciences &
Technology Bldg., Room 104
Roane State Community College
Oak Ridge

TAO Public Stargazes

Saturday, October 21, 2017
Saturday, November 4, 2017
Roane State Community College
Tamke-Allan Observatory (TAO)
7:30 pm to 12:00 am
8:00 pm program
Look at
<http://www.roanestate.edu/obs/>

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

October 2017 Meeting and Program

Wednesday, October 18, 7 PM, **Goff Health Sciences and Technology Building, Room 104, Roane State Community College, Oak Ridge**

Presentation

Young Solar Analogs: What was the Sun Like as an Adolescent?

Speaker



Dave McCallister is a graduate student at the University of Tennessee Knoxville, pursuing a Master's degree in Astrophysics. He has over a decade of experience in education and public outreach, in both formal classroom roles and informal settings like planetariums and star parties. He has been interested in science since he was seven, when his grandfather pointed his telescope toward a crescent Venus in the dark West Virginia skies. He taught high school physics in northern Kentucky for several years before moving to Knoxville with his wife Sarah. He has a B.A. in Physics from Northern Kentucky University and a Master of Arts in Teaching from Thomas More College. Dave is an Astronomy Ambassador designated by the American Astronomical Society, and has been awarded the Wayne Kincaid Award and the Robert W. Lide Citation by the UT Physics and Astronomy Department for service to the astronomy laboratory and outreach programs. When

not huddled up with a telescope under a dark sky, he enjoys baseball, visiting his nieces and nephews, and travelling with his understanding and lovely wife.

Abstract

The Young Solar Analogs project is a long term spectroscopic and photometric monitoring campaign designed to yield a better understanding of how a star's early activity affects a young solar system. By carefully examining the light from these young, small stars, long-term trends in their magnetic activity cycles can be monitored. The faster rotations of these younger stars fuel increased magnetic activity, resulting in far ultraviolet and x-ray emissions. So in a time that early Earth life was trying to find its foothold, the Sun would have been a very inhospitable host. This presentation will describes the basic ideas and motivation behind the project, data collection and reduction methods used, early results and future directions in which the research team is looking.

September 2017 ORION Meeting and Program

Wednesday September 20, 7 PM, Historic Grove Theater, Oak Ridge

The focus of the September ORION meeting was the Great American Eclipse. Several astrophotographers shared their experiences and photographs of the eclipse. Presenters included Phillip Montgomery and Clay Thurston, as well as club members Noah Frere, Roy Morrow, Larry Robinson and David Fields.

Commented [LF1]: Do you remember anyone else that showed photos? Larry maybe?



David Fields presents ORION mugs to guest speakers Phillip Montgomery and Clay Thurston.

ORION President's Perspective: The Search for Knowledge

David Fields

Science focuses on the physical universe. The search for knowledge of the physical universe is a tedious process, with one theory being replaced by another when the Old Theory doesn't quite work, and the New Theory, its deficiencies not discovered, is accepted as 'truth'.

Validation of a new theory can be a difficult process, as one then another and then another of the theoretical predictions may be shown to be true. This is what we have been doing with Einstein's theories of general and special relativity – showing that they predict the behavior of the physical universe.

We have deficiencies in our knowledge. Consider the general deficiencies in quantum mechanics, our understanding of dark matter, determination of subtleties of gravitational waves, and the grand model of subatomic particles: These are the known unknowns, or known challenges.

There are also the unknown unknowns, or unknown challenges. Two of these came to 'light' in the past week. First, there was the first discovery of merging neutron stars, detected both by gravitational waves and by a gamma pulse.

Second, there was discovery of the location of some of the missing (visual) mass in the universe.

Here's just one recent headline – this one about the neutron star merger. I'm including it because it presents a very interesting graphic.

A European Astronomical Observatory Announces an "Unprecedented Discovery"

[NASA/CXC/Caltech](#)

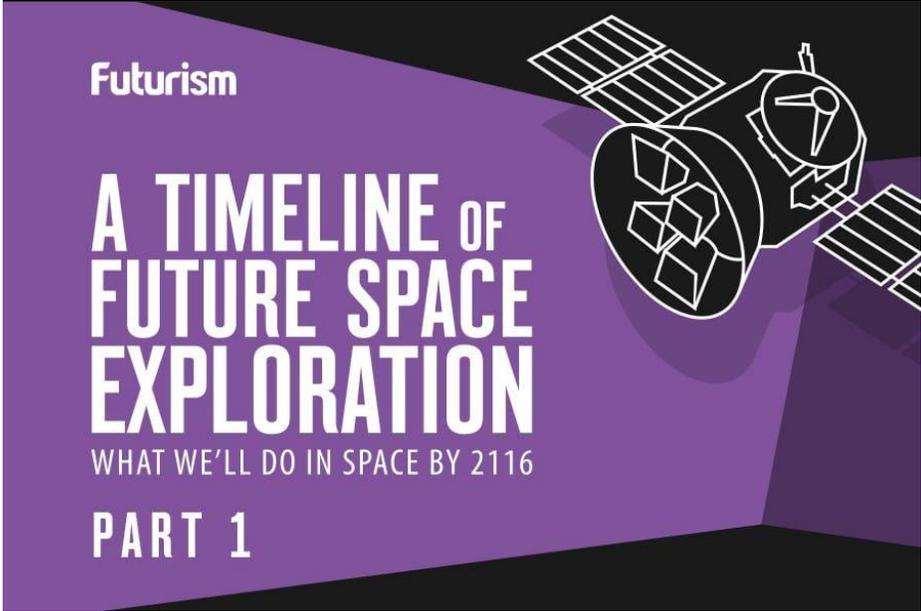
IN BRIEF

According to an announcement from the ESO, scientists working at the observatory have witnessed an astronomical phenomenon that has never been seen before. The details of this discovery will be released next week.

Moments ago, the European Southern Observatory (ESO) announced that they made a revolutionary discovery, one that they will be unveiling to the world on Monday (October 16th). According to the media advisory released today by the ESO, scientists have observed an astronomical phenomenon that has never been witnessed before.

Beyond that, no information is available regarding this most recent announcement.

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Futurism

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WHAT WE'LL DO IN SPACE BY 2116

PART 1

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The last time that astronomers unveiled a groundbreaking discovery of this nature was when scientists working at LIGO (the Laser Interferometer Gravitational-Wave Observatory) detected gravitational waves. Ultimately, the find ushered us into a new era in astronomy, allowing us to see the universe as never before.

To clarify, before this detection, we were only able to perceive the cosmos through observations of electromagnetic radiation—through gamma rays, x-rays, visible light, and so on. Thanks to the LIGO discovery, we can now observe the very ripples of spacetime itself.

Remarkably, the waves were even powerful enough to break the Internet, [bringing down both the LIGO and American Physical Society websites.](#)

Of course, there are a number of mysteries that scientists have yet to explain in relation the origins and evolution of the cosmos. As such, it is difficult to pin down the specific nature of this observation—[perhaps scientists finally observed dark energy,](#) the mysterious force that is thought to make up approximately 73 percent of the universe, or perhaps it is a discovery that scientists never before fathomed. Stay tuned.

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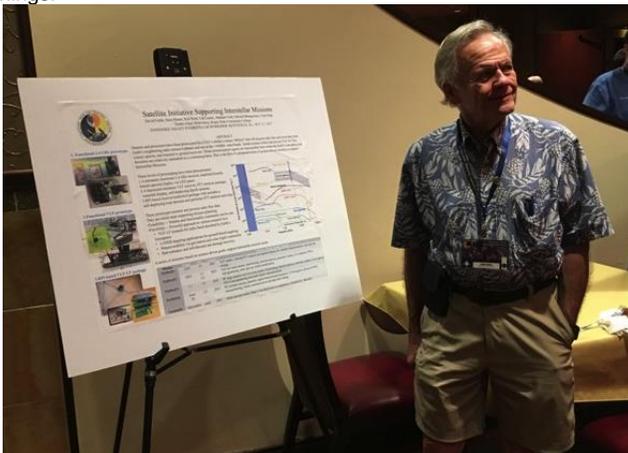
Tennessee Valley Interstellar Workshop first met in Oak Ridge in 2011. It was a futuristic group of people looking ahead to eventual instrumented and perhaps, human-crewed, missions to the distant stars. I was one of the presenters, along with John Rather, Kent Williams, Les Johnson, Ken Roy, Greg Matloff and Claudio Maccone. Since then we've had participation by an international assembly of scientists and engineers, and usually fill available conference space in our venue at Oak Ridge, Chattanooga, or Huntsville.

In 2011, we knew of 1 planet outside our solar system. Now, we know of about 4000 planets beyond our solar system. Interstellar Research is a \$500 million dollar per year activity, stimulating efforts in phase-locked LASER systems, exotic materials research, advanced computing and SETI.

TVIW was founded with a grand vision — to facilitate an “Interstellar” process of knowing and journeying. To attain grand goals, one must first build an infrastructure that supports steady progress, with plateaus along the way. With this technological, philosophical and economic infrastructure, Mankind can set foot on the moon, establish outposts, even cultures, throughout our solar system, and finally, find its (our) pathway to the stars. TVIW was founded to outline and develop this Interstellar Vision. The ladder to the stars has many waypoints, and our activities support the attendant milestones and processes.

Why should we gather to discuss the challenges and opportunities of interstellar travel? *Because we must.* We are compelled by our nature to think positively about the future of humanity in a beautiful yet extremely hostile universe. Life on Earth is wonderful and we should do what we can to protect and preserve it here, but there is more. Among the billions of galaxies, stars and planets, we sense a call to explore. A call to disperse ourselves and settle a multitude of worlds in order to preserve and protect what must be very rare indeed: a bipedal species of intelligent tool users who dare to dream, to love, to create and to aspire for more than mere survival. To do this, we must push boundaries and go. There are many challenges and some of them will take generations to overcome.

These efforts will take all of humanity. We will need everybody ‘onboard the boat.’ We hope that one day we will see the great diversity that is the human race on the way to other planets and other stars. I presented a poster, among other things:



Commented [LF4]: I have other photos, but this one made it look like you were interacting with someone and the poster was more in focus than the others. In all of them, your right eye is in shadow.

TAO Events

Roy Morrow

On September 16, members of the Tellico Astronomers group attended the public stargaze at TAO. Here are David Fields and Carol DeForest with a modified Starblast SCOPE

Carol is manager of the Tellico Community Library and was responsible for obtaining the grant to purchase the two telescopes. The main purpose of this visit was to get Tellico astronomers familiar with TAO and to "field test the modified telescopes.

Some Tellico astronomers are shown next to the main TAO dome. The club will provide technical support to the Starblast users.



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Dave [MacCallister](#) brought his huge C-14 Celestron on a Losmandy equatorial mount. He plans to have a POD like this one and just wanted to see how things fit. POD is **P**ortable **O**bservatory **D**ome

TAO is open to the public on 1st and 3rd Saturday of each month.

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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