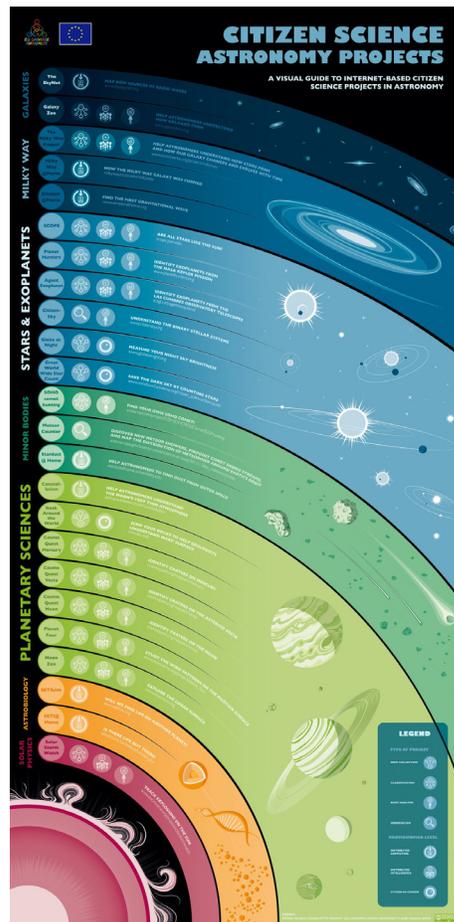


December, 2017

Next Meeting on January 19th

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The Milwaukee Astronomical Society will hold its next meeting on Friday, January 19th, at 8 PM at the Observatory.

Casey McGrath, a graduate student and **Shawn Kwang**, an associate scientist at the Center for Gravitation, Cosmology, and Astrophysics will give talk entitled: **Citizen Science, and the projects that you can be a part of!** "We live in an era where the experiments we run allow us to collect more data than anyone could ever hope to study by themselves in their own lifetime. We need all of the help that we can get - so would you like to don the lab-coat and become a scientist yourself? Many projects, including Einstein@home, SETI@home, or the Zooniverse projects, allow you to help out in the collective pursuit of knowledge, from hunting for gravitational waves, to listening for extraterrestrial life, to studies in biology, history, medicine, language, and more! And all from your own personal computer. So come join us to learn more about what some of these projects are, how they work, and what you can do to be a part of them!"

The meeting will be preceded by a Board Meeting from 7 PM that is open for everybody who interested in organizational and Observatory related issues.

Message from Editors

When the editorial office was taken over by the current staff in the beginning of 2011, we asked help from Members to keep the newsletter diverse and interesting. We encouraged everybody to share personal stories describing experiences, techniques, projects, or any astronomy related topics. During the past seven years, numerous Member's Stories appeared in the newsletter, such as Imaging Faint Galaxies, How I got Started in Astronomy, and Attending my First AAVSA Meeting, just to mention a few.

We would like to maintain this tradition and kindly ask our Members to send articles on preferred topics to the masfocalpoint@milwaukeeastro.org. We are excited to hear from you and would appreciate your contribution!

The Year of 2017

Once again, it is time to look back and summarize all the major events as well as accomplishments that the Club has achieved during the year 2017.

We have successfully completed the Quonset remodeling, which has started in October of the previous year. This was a huge effort and involved the participation of many members. Now we have a modern lecture hall that we can be proud of! An important consequence of this project is that the A-building, the Quonset, and one of the bathrooms are now wheel chair accessible. Other important maintenance projects included the repair or re-build of the slit/dome movement systems of all three big domes. The garden hose spigot valve was overhauled. The last big project of the year was the automation of the Z-dome that also involved replacing the whole control mechanism and the old motors that move the dome. Now the dome is synchronized with the mount and can be moved through software from the control room. The issue of leaky Solar Dome was finally tackled by purchasing a leak-proof replacement dome that has been assembled and now awaiting for a warmer day to swap it over.

As a public outreach effort we hosted seven Public Nights, several private Observatory tours, held presentations at Public Libraries, appeared in the News of local TV channels and newspapers. We joined the NASA's Night Sky Network program, organized the annual Yerkes Star Party, and participated in Sheboygan Astronomical Society's Swap'N'Sell event. During the Solar Eclipse many of us had a chance to show the Sun through a telescope to the public.

MAS members enjoyed fellowship at the annual picnic and Christmas Party, participated in the Summer Campout, and traveled to see the Great American Solar Eclipse. The latter event was undoubtedly the major astronomical event of the year. Many members who travelled to every possible sites all along the totality zone shared their experiences during a monthly meeting dedicated exclusively to this occasion.

In May three new members joined the Board of Directors and all the Officers were re-elected to their current positions. Our membership has grown by a record number of 66. As part of the effort to better accommodate the needs of the members and keep them in the Club we conducted a survey. To provide the membership with more opportunity to come out to the Observatory to learn we restarted the First Wednesday Meetings, an informal get together and conversation on any astronomy and equipment related topics. This program turned out to be a great success. We also overhauled the key holder system and now the hosts of the Member's Nights will ensure a more welcoming and professional environment for newcomers every Saturday. Our Google group was extremely active providing a good mix of information regarding the upcoming Club events, equipment status, latest astrophotos, and interesting astronomical events for the membership.

The editors would like to thank everybody for their effort and wish all of you a Happy New Year 2018.



Christmas Party

The 2017 Christmas Party was held on December 2nd at the Observatory. The nicely decorated and heated Quonset provided a comfortable environment.

A record number of members (about 40) came together to enjoy fellowship and the delicious food. Pizza in variety of flavors was delivered, and everybody brought a holiday dish to share.

By watching a slideshow presentation we recalled the most memorable moments of the year.



Observatory News

Engagement in B-dome

It was like Déjà vu all over again, there I was opening B-Dome and preparing for a couple's tour that was secretly the setup for a marriage proposal. It seemed so familiar, but what are the chances some one else would want to propose at the Observatory, on a starry night? Well that is exactly what Garrett Wolff did with his girlfriend Corrine Hartenstein on December 1st, 2017.

Garrett contacted me to setup the "tour" a few weeks ahead of time. Garrett and Corrine had purchased a star from Star Register named "Beacon of Our Love" and Corrine was told the only reason to tour the Observatory was to see this star in the constellation Draco. He had given me the coordinates from their certificate, so I was able to get B-scope setup and on target before they arrived just as the sky started clearing. Next, I put the hand-written note from Garrett asking for Corrine to marry him on to the chart light on B-scope. That ploy worked so well for last year's proposal, I hoped it would go as well this time too.

The young couple arrived, first being greeted by my dog Ruby, then found their way to B-dome where they were shown the telescope along with an explanation about how I was able to locate their star. I told Garrett to climb the ladder to look first and as Corrine started up to the eyepiece I excused myself saying that I had to see what the dog was up to. I return a little while later to find Corrine who was totally surprised, had replied yes.

by Paul Borchardt



Maintenance in A-building

A new outlet was installed in the storage room to give power to a computer running the TV screen facing the entrance door.



In the Astronomical News

Artificial Intelligence, NASA Data Used to Discover Eight Planet Circling Distant Star

Our solar system now is tied for most planets around a single star, with the recent discovery of an eighth planet circling Kepler-90, a Sun-like star 2,545 light years from Earth. The planet was discovered in data from NASA's Kepler Space Telescope. The newly-discovered Kepler-90i – a sizzling hot, rocky planet that orbits its star once every 14.4 days – was found using machine learning from Google. Machine learning is an approach to artificial intelligence in which computers “learn.” In this case, computers learned to identify planets by finding in Kepler data instances where the telescope recorded signals from exoplanets.

The discovery came about after researchers Christopher Shallue and Andrew Vanderburg trained a computer to learn how to identify exoplanets in the light readings recorded by Kepler – the miniscule change in brightness captured when a planet passed in front of, or transited, a star. Inspired by the way neurons connect in the human brain, this artificial “neural network” sifted through Kepler data and found weak transit signals from a previously-missed eighth planet orbiting Kepler-90, in the constellation Draco. About 30 percent larger than Earth, Kepler-90i is so close to its star that its average surface temperature is believed to exceed 800 degrees Fahrenheit, on par with Mercury. Its outermost planet, Kepler-90h, orbits at a similar distance to its star as Earth does to the Sun. “The Kepler-90 star system is like a mini version of our solar system. You have small planets inside and big planets outside, but everything is scrunched in much closer,” said Vanderburg, a NASA Sagan Postdoctoral Fellow and astronomer at the University of Texas at Austin.

Shallue, a senior software engineer with Google's research team Google AI, came up with the idea to apply a neural network to Kepler data. In his spare time, Shallue started googling for ‘finding exoplanets with large data sets’ and found out about the Kepler mission and the huge data set available. Machine learning really shines in

situations where there is so much data that humans can't search it for themselves.

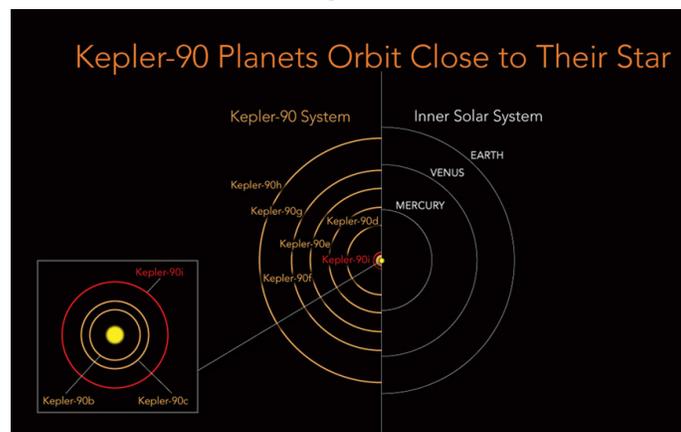
Kepler's four-year dataset consists of 35,000 possible planetary signals. Automated tests, and sometimes human eyes, are used to verify the most promising signals in the data. However, the weakest signals often are missed using these methods. Shallue and Vanderburg thought there could be more interesting exoplanet discoveries faintly lurking in the data. First, they trained the neural network to identify transiting exoplanets using a set of 15,000 previously-vetted signals from the Kepler exoplanet catalogue. In the test set, the neural network correctly identified true planets and false positives 96 percent of the time. Then, with the neural network having “learned” to detect the pattern of a transiting exoplanet, the researchers directed their model to search for weaker signals in 670 star systems that already had multiple known planets. Their assumption was that multiple-planet systems would be the best places to look for more exoplanets.

They got lots of false positives of planets, but also potentially more real planets. It's like sifting through rocks to find jewels. If you have a finer sieve then you will catch more rocks but you might catch more jewels, as well.

Kepler has produced an unprecedented data set for exoplanet hunting. The spacecraft now is operating on an extended mission and switches its field of view every 80 days.

These results demonstrate the enduring value of Kepler's mission. New ways of looking at the data – such as this early-stage research to apply machine learning algorithms – promises to continue to yield significant advances in our understanding of planetary systems around other stars. Researchers are sure there are more firsts in the data waiting for people to find them. This work was performed through the Carl Sagan Postdoctoral Fellowship Program executed by the NASA Exoplanet Science Institute.

by Felicia Chou and Alison Hawkes, NASA



Credit: NASA/Wendy Stenzel

Adopt a Telescope Program - Signup Sheet

Adopter	Scope	Location
1 Sue Timlin/John Hammetter	18" F/4.5 Obsession	Wiesen Observatory
2 Steve Volp	12.5" F/7.4 Buckstaff	B Dome
3 Robert Burgess	12.5" F/9 Halbach	A Dome (Armfield)
4 Russ Blankenburg	18" F/4.5 Obsession	Albrecht Observatory
5 Jeff Kraehnke	14" F/7.4 G-scope	Z Dome
6 Lee Keith/Tom Kraus	12" F/10 LX200 EMC	Tangney Observatory
7 Herman Restrepo/Matt Mattioli	8" F/11 Celestron EdgeHD	Ray Zit Observatory
8 Tamas Kriska	14" F/1.9 F-scope	Jim Toeller Observatory
9 Paul Borchardt	Solar scope	SkyShed POD

At Your Service

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Lee Keith	414-425-2331
Frank Kenney	414-510-3507
Jeff Kraehnke	414-333-4656
Sue Timlin	414-460-4886
Steve Volp	414-751-8334

January Keyholders

1/6	Jeff Kraehnke	414-333-4656
1/13	Tamas Kriska	414-581-3623
1/20	Frank Kenney	414-510-3507
1/27	Tom Schmidtkunz	414-352-1674



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