

Eugene Astronomical Society



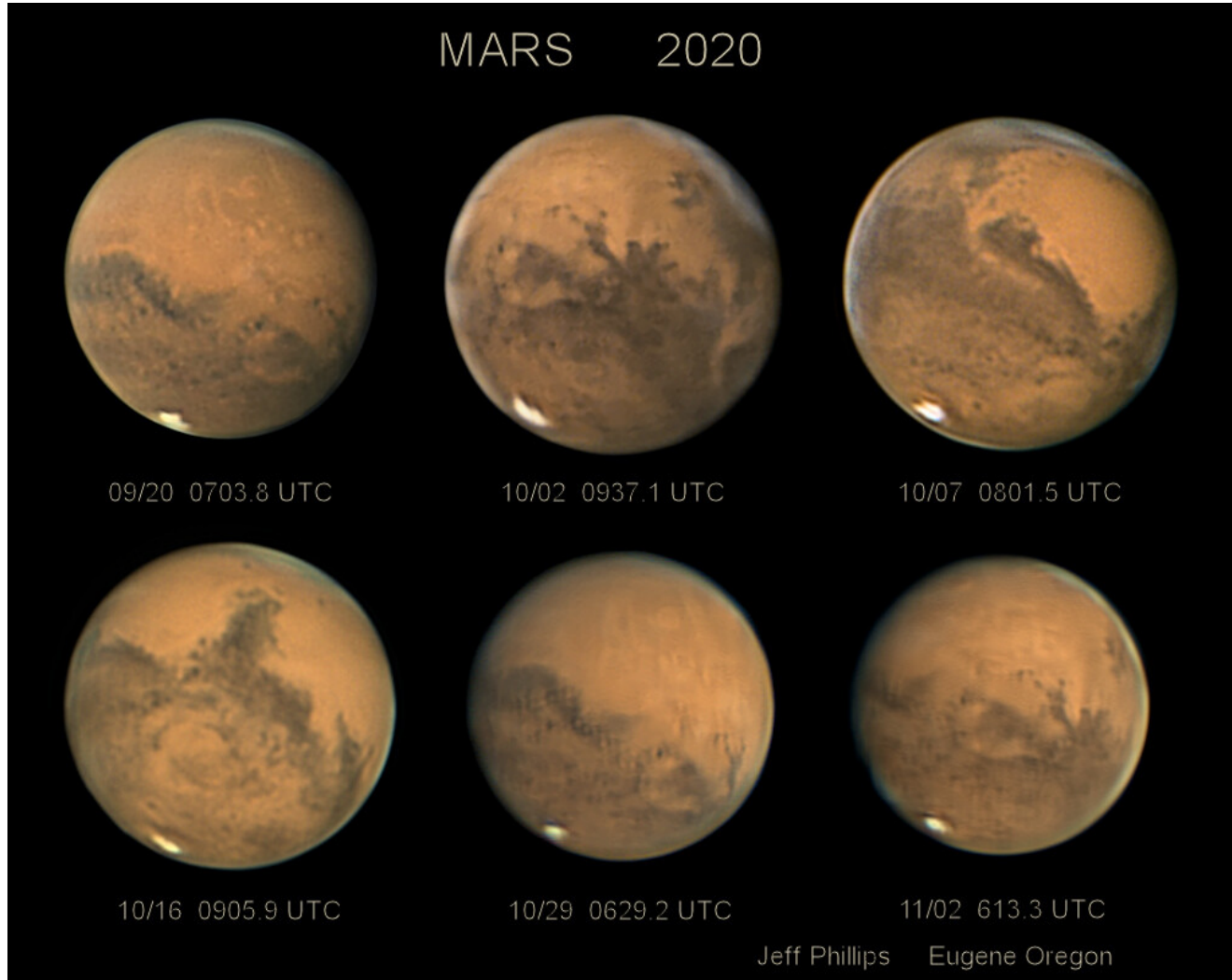
# Io

December, 2020



PO Box 591 Lowell, OR 97452

www.eugeneastro.org



Mars 2020 [1]

Jeff Phillips

President: Andrew Edelen 618-457-3331  
 Secretary: Randy Beiderwell 541-342-4686  
 Board Members:  
 Oggie Golub - Randy Beiderwell - Ken Martin -  
 Jerry Oltion

**- Our PO Box has changed!**

**PO Box 591  
Lowell, OR 97452**

Annual Club Dues \$25

EAS is a proud member of The  
Astronomical League.

# December Meeting - Thursday, Dec. 17 7pm

PLEASE NOTE THAT ALL MEETINGS ARE CURRENTLY VIRTUAL

TO BE ANNOUNCED.

We have had some terrific virtual meetings the last few months, thanks to all who have worked to make it happen!

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## November Meeting

Andy Edelen took us through the many and varied star catalogues used today, from Messier in 1774 to modern specialized catalogues, how they are used, why so many exist and where they came from. This was a terrific walk through some of the history of astronomy as well. Andy explained the origin of many catalogues and their various classifications and uses.

You can see the talk by Andy on YouTube at:

[https://www.youtube.com/watch?v=arXbAiz\\_mcw](https://www.youtube.com/watch?v=arXbAiz_mcw)

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## EAS donates \$1,000 to Science Center

In recognition of the extreme financial difficulty the Eugene Science Center has been facing during the Covid-19 lockdown, the Eugene Astronomical Society board of directors has agreed to donate \$1,000 from our general fund to the Science Center to help them make ends meet. The Science Center has been very generous to us for many years, allowing us to meet in the planetarium without paying any fees, providing an employee at their expense to open and close the building for us and be on site during our meetings, and allowing us to use the planetarium projector for several of our programs. The Science Center also provides tremendous value to the people of Lane County and beyond. Their mission dovetails nicely with our own mission of public outreach, so it seems right to use some of our resources to help them through a difficult time.

Thanks to all our dues-paying members who helped make this donation possible.

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## Do you have something for the newsletter?

If you have an article, photo, meeting notes, stories, etc. that you would like to share with the members, please contact me, I'd be happy to add them to the newsletter. If you have photos you would like to submit, I'm trying to include more information about the process and equipment used.

Astrophotographers: I want to offer these pages as a way to not only show off your terrific photos, but to provide us with information on how they are taken and processed. Seeing the amount of work that goes into these amazing images is always fascinating, and makes us appreciate them even more!

Bruce Sackett - [bruce@busymind.net](mailto:bruce@busymind.net)

# The New Heavens

TEXT BY GEORGE ELLERY HALE

*I have a fascination with history as much as astronomy. When I have the chance to connect the two I'm going to jump into it every time. For this one, a bit of back story: part of what brought me into astronomy in the first place was my great uncle Charlie, who was interested in geology and astronomy. In the 1940s, he built himself a 12.5" telescope with a mount based on the Hooker equatorial. He also built a small library of astronomy and telescope building books, which was all handed down to me when he passed. One of those books was 'The New Heavens' by George Ellery Hale (1922). I thought a small segment of the book would make an interesting article to fill in this months newsletter.*

## The New Heavens (excerpt)

If space permitted, it would be interesting to survey the progress already accomplished by modern methods of astronomical research. Hundreds of millions of stars have been photographed, and the boundaries of the stellar universe have been pushed far into space, but have not been attained. Globular star clusters containing tens of thousands of stars, are on so great a scale (according to Shapley) that light, traveling at the rate of 186,000 miles per second, may take 500 years to cross one of them, while the most distant of these objects may be more than 200,000 light-years from the earth. The spiral nebulae, more than a million in number, are vast whirling masses in process of development, but we are not yet certain whether they should be regarded as "island universes" or as subordinate to the stellar system which includes our minute group of sun and planets, the great star clouds of the Milky Way, and the distant globular star clusters.

These few particulars may give a slight conception of the scale of the known universe, but a word must be added regarding some of its most striking phenomena. The great majority of the stars whose motions have been determined belong to one or the other of two great star streams, but the part played by these streams in the sidereal system as a whole is still obscure. The stars have been grouped in classes, presumably in the order of their evolutionary development, as they pass from the early state of gaseous masses, of low density, through the successive stages resulting from loss of heat by radiation and increased density due to shrinkage. Strangely enough, their velocities in space show a corresponding change, increasing as they grow older or perhaps depending on their mass.

It is impossible within these limits to do more than to give some indication of the scope of the new astronomy. Enough has been said, however, to assist in appreciating the increased opportunity for investigation, and the nature of the heavy demands made upon the modern observatory. But before passing on to describe one of the latest additions to the astronomer's instrumental equipment, a word should be added regarding the chief classes of telescopes.

*Thank you for letting me share a passion. Clear skies!*



Sadr Nebula [2]

Ronald Perez



NGC 7293 - The Helix Nebula [3]

Mark Wetzel

## Member Astrophotography in this issue

### [1] Mars 2020 by Jeff Phillips

These are my best shots from 2020, three were taken with a C11 at f/28 and three were taken with a C14 at f/22.

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### [2] Sadr Nebula by Ronald Perez

Taken with a Stellarvue 70t with ZWO 1600, has about 3.5 hours of data behind it, and was processed using PixInsight.

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### [3] NGC 7293 - The Helix Nebula by Mark Wetzel

From Mark: I went to Casitas de Gila, Gila, New Mexico in October for astrophotography under clear, dark skies. I was there for 12 days and there were a few nights of excellent transparency and seeing. However, high altitude smoke from the California wildfires made imaging a challenge for a few nights. The first deep sky object that I imaged was the Helix Nebula in the constellation Aquarius. This planetary nebula was captured with two narrowband filters, Hydrogen-alpha (Ha) and Oxygen-III (OIII) over three nights. This is a false color image that combines Ha in the red channel, and Ha and OIII in the green channel and OIII in the blue channel. The white dwarf can be seen in the center of the pupil of the eye. This image also reveals the outer "eyebrow" of expanding hydrogen gas.

NGC 7293 is a large planetary nebula in the constellation Aquarius. Planetary nebula form when a star the size of the Sun nears the end of its life as a red giant. Nuclear fusion in the core of the star slows and gravity wins over the outward pressure from the heat and radiation of nuclear fusion. The core collapses and the resulting shock wave pushes the expanded gas and plasma of the red giant outwards at high velocity. The remaining collapsed core becomes a white dwarf. The radiation from the white dwarf illuminates the expanding cloud. NGC 7293 is about 2.5 light years across, and it is only 650 light years from Earth (SkySafari6 Pro). It is about 10,600 years old.

The term planetary nebula is a misnomer. William Herschel coined the term "planetary nebula" since these objects looked like fuzzy planets with some color, similar to the newly discovered planet Uranus. Herschel missed the Helix Nebula, as it is large, spreading out the light. Karl Harding discovered it in 1824 (SkySafari6 Pro). While planetary nebulae are quite common in the Milky Way galaxy, most are very small. NGC 7293 is one of the largest in our galactic neighborhood. In about 5 billion years, our Sun will experience the same fate.

Imaging details:

Celestron 9.25" Edge HD SCT with 0.7x focal reducer and off-axis guider

Celestron CGEM II mount

ZWO ASI 1600MM Pro cooled monochrome camera (-100C), 36mm ZWO Hydrogen-alpha, Oxygen-III

Software: Sequence Generator Pro, PHD2 guiding, Celestron CPWI mount control, PixInsight and Photoshop

Hydrogen-alpha 5 min x 68 subframes (340 min), Gain 139, Offset 21, 1x1 binning

Oxygen-III 5 min x 62 subframes (310 min), Gain 139, Offset 21, 1x1 binning

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*Thanks Dezmo!*