



# WESTMINSTER ASTRONOMICAL SOCIETY, INC. (WASI)

## Membership News



Volume 1 – Number 4

(formerly the Mason Dixon)

Summer 2023

## Message from our Society's President, Cindy Ward

With the winter's cold (not to mention this Spring's cold and wet weather!) behind us we can look forward to observing in shirtsleeves and shorts for a few months. Though we'll miss some of the spectacular objects of those seasons, summer brings its own delights. The Milky Way glows in Cygnus through Sagittarius, and some great Messier objects abound. M13, M27, M57 and others await our viewing pleasure.

Do check out our monthly meetings and other activities at <https://www.westminsterastro.org/>. You can join us in person on the second Wednesday of each month at Bear Branch, or tune in electronically via Zoom.

Clear Skies,  
Cindy

## WASI News

**A survey! We need your help.** Please go online and fill out our new survey, which is designed to find out what you'd like from WASI. The survey is here [bit.ly/3pFkqUE](https://bit.ly/3pFkqUE) and is only 6 questions.

As we're replacing the telescope mount in the observatory, the old mount is now for sale. It's a Celestron CGE in perfect working order. This heavy-duty go-to mount handled our big 14" telescope with ease. For more info contact Jeff Burns, our Observatory Director, at [jeff.burns@orano.group](mailto:jeff.burns@orano.group).

Some WASI merchandise is now available; here are the suggested donations:

- 2 inch outdoor WASI logo stickers: \$1
- Eclipse glasses with the WASI logo; 1 for \$3, 2 for \$5
- 3 inch iron-on WASI logo patches, \$3 (great for a ball cap, tote bag, shirt, or any other fabric)

Membership picnic planning is underway for July or August, followed by star party at BBNC. Sign up for pot luck will be posted in groups.io again. Bring food, friends, family and plan for setting up/enjoying observing, just for us. Ants and fireflies provided at no extra charge!

## More WASI News



WASI's Laurie Ansorge and Shannon Markward were highlighted as Eclipse Ambassadors for the Astronomy Society of the Pacific's 2023/2024 solar eclipses. They completed the "Pilot" training, and you'll be hearing lots more about these upcoming events. Laurie is, of course, WASI's treasurer, and Shannon is a Senior at Towson University.

**Wanted:** someone to seasonally update the WASI bulletin board at BBNC, outside of the planetarium.  
Contact Laurie Ansorge at [lhager@comcast.net](mailto:lhager@comcast.net).

## Notes on Outreach

Please refer to the Night Sky Network calendar for details of each event. One highlight is the Cherry Spring Star Party June 15<sup>th</sup> to 17.

We're getting lots of requests for outreach events, and that we would like to encourage members to volunteer to help with these. Some will have hundreds to thousands of attendees. We have plenty of materials available.

The October eclipse is garnering interest from all of the Carroll County libraries, and we would like to have a member at each location. We have 3000 pairs of eclipse glasses, which are \$3 each, or two for \$5. Be aware, though, that these will run out so get them now. Expect a price increase as the date draws near.

The libraries are anxious to do something with the telescope loaner program, though exactly what is unclear. We need members to help keep the equipment in shape.

**Bienvenue en Louisiane! (Welcome to Louisiana!)**  
Join us for this unique and exciting amateur astronomy gathering!

**ALCON 2023**

**KEYNOTE SPEAKERS**

- ★ David Eicher—writer, editor-in-chief of *Astronomy Magazine*
- ★ Fred Espenak—co-author of *Totality: The Great American Eclipses of 2017 and 2024*
- ★ David Levy—author, comet hunter

**FIELD TRIPS**

- ★ Irene Pennington Planetarium
- ★ LIGO (Laser Interferometer Gravitational-Wave Observatory) Livingston\*
- ★ Louisiana State University Physics & Astronomy
- ★ Highland Road Park Observatory

\*Spaces are limited for this trip!

**SPEAKERS** ★ Pranvera Hyseni ★ Guy Consolmagno ★ Dan Davis ★ And many more!

Brought to Baton Rouge by the **Baton Rouge Astronomical Society**

★★★ Registration is now open! Check [alcon2023.org](http://alcon2023.org) ★★★

# Motorizing a Mount using Onstep

By Douglas Thomas

Recently, I converted a 20-year-old manual Orion Skyview Deluxe Equatorial mount into a go-to mount using Onstep firmware. It is belt driven with stepper motors and a Wemos board to control them. Each part was selected and purchased individually through Amazon, Aliexpress, Jameco, or eBay. Even though the circuitry is considered an "easier" setup to build, it took a bit of effort to figure things out. For instance, microstepping a stepper motor and uploading firmware. The Onstep website provides a great deal of information

that walks through nearly all of the electronics, but it requires some diligence to work through for someone unfamiliar with electronics.



Orion Skyview Deluxe EQ Mount motorized using Onstep firmware.

The components that were used for the final build cost about \$100 excluding the power source and mount; however, there were several rebuilds and mistakes. In the end, it probably cost a little more than twice the cost of the final build. Note that I have a small workshop with quite a few tools and a 3d printer, which was used to create the housing and mounts for the motors.

There were a few challenges in this endeavor. The first challenge was designing a case that attached to the mount. There were several versions for the motor cases before getting a fully functioning design. The second challenge was torque – there was not enough of it. The

first design attached the motors directly to the mount and they had just barely enough torque to move the telescope without slipping. It seemed to work fine, but when the mount was taken into the cold, it got slightly tighter and the motors would slip. To address this issue, a timing belt and gears with a 3:1 ratio, purchased on Amazon, was attached to the motors; however, the belts slipped too. It ended up needing two belts on each axis and the mount also needed to be disassembled, cleaned, and greased.

When everything was finally working, the go-to speed was painfully slow. It was not clear at first, but there are settings to change the speed. Moreover, there was some fumbling with the new software. Also, the circuitry was overheating; so, a fan was added for cooling.

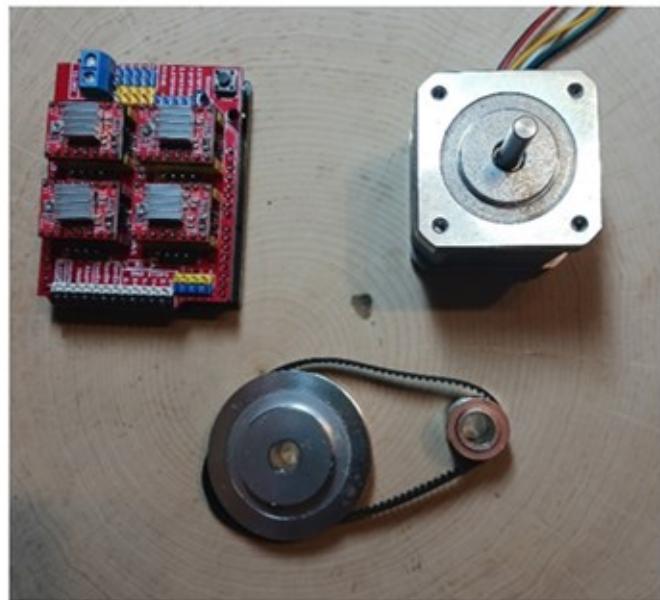
The final challenge was that there was a great deal of backlash that prevented PHD2 from guiding the mount. This was corrected by replacing soft washers in the worm gear box to thrust bearings. This allowed for a tighter fit that reduced the amount of shift in the worm gear.

The mount connects easily and reliably to my phone via Bluetooth and is controlled using two apps: an Onstep app to align and SkySafari to select objects. Since I want this to be portable, my preferred method of control is my phone, but I am able to connect to my laptop via Bluetooth and guide the mount using PHD2. The mount uses the LX200 protocol, which doesn't work with some software, such as EQMOD.

It took a few months to finish this project and several more before it was working smoothly. I have a full-time job and a young child. So, time is limited, but I dedicated as much time as I could to build it. One major delay was in getting parts. Some are shipped from China and take a month to arrive. Since many of these parts are cheap (~\$10), I would recommend buying more than one of each component, as you might break something like I did.

This project did not require specialized knowledge. I have near zero knowledge in electronics, mounts, motors, or gears. I do have some knowledge about creating 3d drawings to use with 3d printing, but I learned most of this using the internet. What it really requires is perseverance. I had quite a few failures or setbacks. For instance, the final case for the motors and circuit board was about the tenth version that I printed.

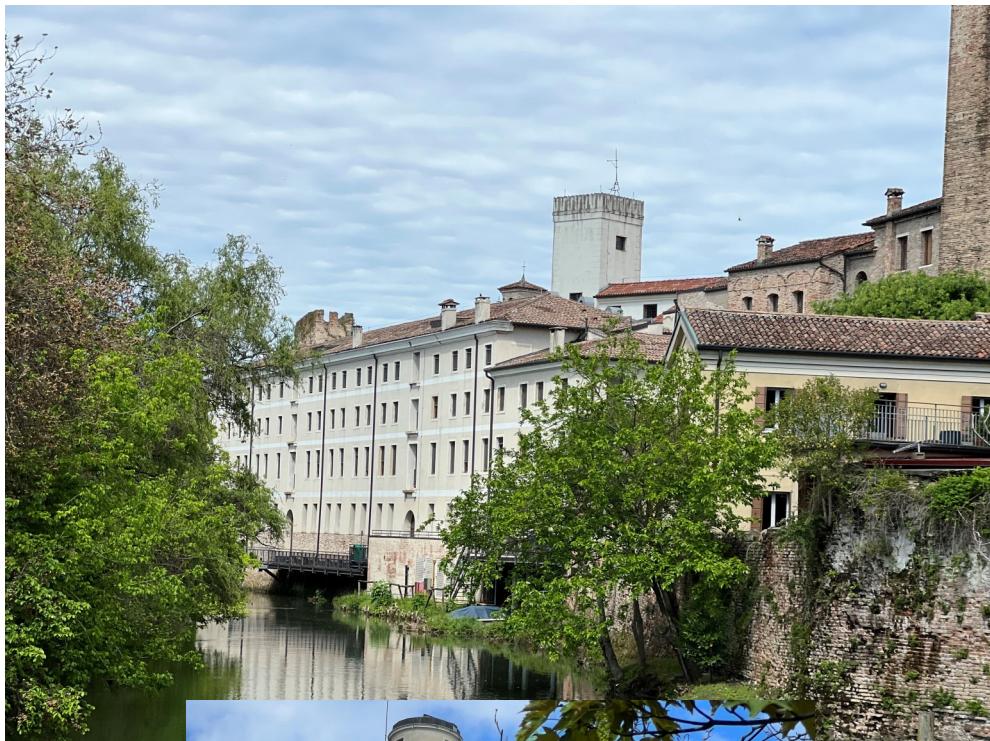
**REQUIRED MATERIALS:** two stepper motors (~\$15 each), Wemos circuit board (~\$10), CNC V3 shield (~\$10), two controllers for the stepper motors (~\$8 each), connectors/bolts/other hardware (~\$30), two sets of timing belts and gears (~\$10 each), plastic for 3d printer, and 12v power source (\$\$\$). Two free software tools were used: Google Sketchup for designing parts and Arduino IDE for uploading firmware to the Wemos board.



Top Left: Arduino board and motor drivers.  
Top Right: Stepper motor. Bottom Center:  
Belt and gears.

## Doc Visits Galileo

While driving from Florence to Venice, Doc Desai found a historic place in Padova. Part of the University of Padova, this is where Galileo went up in the tower to view Jupiter. He found "three fixed stars, totally invisible by their smallness" (later, four) next to Jupiter, and noted that their positions changed with time. These moons shocked astronomers, who believed that all celestial bodies circled the Earth. Enjoy Doc's pictures:



## Astrophotos From Our Members



*Doug Thomas took this photo of the Whirlpool Galaxy with his 6" Meade Maksutov*

Check out Laurie Ansorge's Unistellar Messier Marathon on Cloudy Nights. There are 109 of 110 objects with images as 'live' and also 'enhanced vision' (stacked). It's kind of cool having the set for comparison and to see what this scope can do. Enjoy: <https://www.cloudynights.com/gallery/album/22749-unistellar-evscope-messier-marathon/>

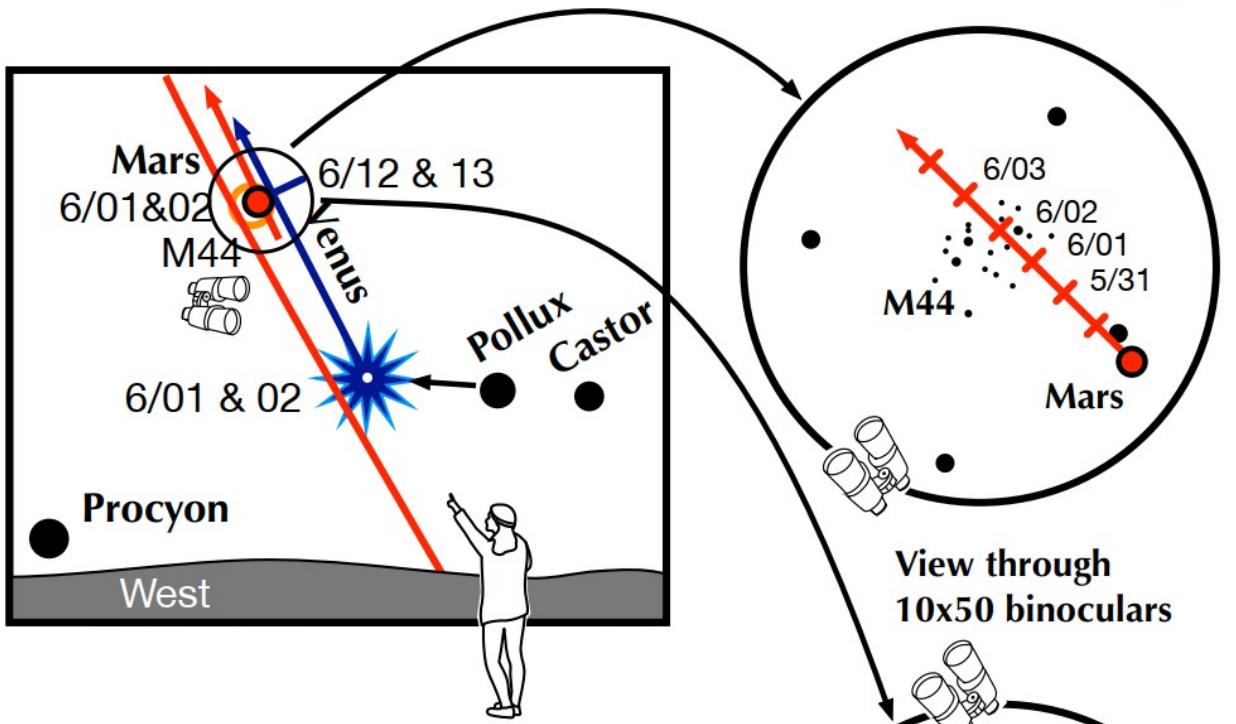
Here's a sample:



# A Note From The Astronomical League

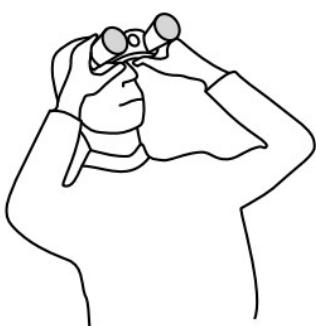


## A must see celestial planetary play: Two planets visit the Beehive



Beginning on June 1, look to the west-northwest 90 minutes after sunset.

- The twin stars of Gemini, Castor and Pollux, will be found forming a horizontal bar low above the horizon.
- Brilliant Venus shines to their left effectively forming the very bright third member of a set of triplets!
- On the same evening and the next, red Mars slides in front of M44, aka the Beehive Star cluster, positioned above Venus. Use binoculars to find Mars sitting amid the many stellar bees.
- Ten nights later, it is Venus' turn to stay at the Beehive for two consecutive nights. The planet travels along the outskirts, farther from Beehive central than Mars moved. Again, bring out the binoculars. How does the glare of brilliant Venus affect the scene?



# WASI FAQs

**Newsletter** - Please send pictures, articles, and ideas for the newsletter to [jack@ganssle.com](mailto:jack@ganssle.com).

**Facebook** - We're active and sharing images on our Facebook page, found here:

**Join/Renew** membership link: <https://www.westminsterastro.org/join-wasi/>

If you've already entered your contact information (renewing), skip the "database" link: <https://paypal.me/WAstroSInc>

Dues are payable via PayPal on the link above, by check or cash (and through your bank's on-line bill payment). Membership Dues are \$25/year for individuals or family, and youth under 18 is \$5/year.

- On time payment means eligibility for the annual incentive .
- Keep access to the members-only groups.io pages/information
- Receive members-only access/notifications on Night Sky Network
- Keep/get discount rates for popular astronomy magazines
- Borrow from the WASI scope/literature library



**Files and club member correspondence & wiki links are found here:** <https://westminsterastro.groups.io/g/main>. Remember to set your communication preferences.

**Outreach/event** calendar is found on: <https://nightsky.jpl.nasa.gov/index.cfm>. Set your communication preferences here as well.

**Changed address, email or phone?** Please update your information and send a message to the web-master and/or [treasurer@westminsterastro.org](mailto:treasurer@westminsterastro.org).

We meet monthly on the 2nd Wednesday of the month:

Back to Basics from 7:15 PM – 7:30PM; General Meeting 7:30PM – 9:30PM  
Bear Branch Nature Center Carroll County; 300 John Owings Rd.; Westminster, MD 21158  
Website: <https://www.westminsterastro.org/> (Zoom info for hybrid meetings)