



Mid-Hudson Astronomical Association

March, 2016

Website: www.midhudsonastro.org

Yahoo Group: MHAstro

President : Willie Yee
Secretary: Jim Rockrohr
Newsletter Editor: Rick Versace
Publicity: Paul Chauvet
Parks Liaison:

Vice President: Candace Wall
Treasurer: OPEN (Ken Bailey until June)
Membership Coordinator: OPEN
Webmaster: Paul Chauvet
College Liaison: Dr. Amy Forestell

Directors: Karl Loatman, Joe McCagne, Steve Carey, Paul Granich

Minutes of the monthly meeting of the Mid Hudson Astronomical Association, February 16, 2016

The meeting was called to order at 7:31 PM by President Willie Yee in the Auditorium of the Coykendall Science Center at SUNY, New Paltz, NY.

The minutes were approved as published in the most recent newsletter.

Officer's Reports:

Membership: Caryn Sobel was not present. (REMINDER: Dues are due!)

Treasurer: Ken Bailey was present, but see his latest report as published in the newsletter.

Treasurer's Report for the month of February, 2016

Date: 12 March, 2016

Bank Balance: \$2434.86
Outstanding Checks: \$ 101.87
Outstanding Deposits: \$ 23.97
Ending Bank Balance: \$2256.96
Checkbook Balance: \$2256.96
Balance with Bank: Yes

Ending balance total: \$2256.96

Notes: Outstanding deposit is a deposit for membership dues from PayPal. Outstanding checks are for Dutchess County Science Fair prizes, and the fee for Vendor Booth at NEAF 2016.

Respectfully submitted: Ken Bailey
Treasurer

Outreach: Candace Wall was present and the following were discussed:

- **James Evans Elementary School** (Wappingers Falls): Looking for a brief presentation and outdoor star gazing in April/May for 6-12 year olds on a Thursday or Friday.
- **Montessori Schools** (New Paltz?): Looking for a regular (monthly?) presentation. Joe Macagne working on this.
- **Stone Ridge Public Academic Fair:** Saturday, April 2, requesting a S.T.E.A.M. Focused (Science, Technology, Engineering, Arts, and Mathematics) presentation.
- **Fishkill Plains Elementary School:** Looking for a presentation and star gazing on a Wednesday or Thursday in March, April, or May.
- **Girl Scouts Camporee at Ulster County Fairgrounds:** June 11. Looking for an activity for the girls during the day and star gazing for those who stay overnight.
- **Sam's Point:** Looking for a day time solar weekend day event in early spring. Willie working on this for April and to include a moon viewing.
- **Olana:** Current dates are April 23 and September 3 (Labor Day weekend). Also looking for 'scopes on their Movie nights. Willie to get dates (Fridays).

Publicity: Paul Chauvet was present. Send him info on public events.

Webmaster: Paul Chauvet present. No issues known.

Upcoming programs: Candace Wall was present and the following information was shared:

- March – Willie Yee on Exoplanets
- April – Tarun Biswas
- May – (TBD)
- June – Steve Bellevia

Old Business:

- **We still need a Treasurer.** Ken will be leaving sometime this summer and we need a replacement. Please consider volunteering for this position.
- **Club Telescopes:**
 - 13" Dobsonian (Jack Chastain). Mirror removed. Will be sending it for recoating out soon.
 - Criterion 8" SCT is available. Tabletop use (no tripod). See Willie.
 - ETX 125 has a focuser issue. Willie has it.
 - 4" with Paul Chauvet.

- 8" Newtonian on an equatorial mount needs to be picked up by Ken Bailey from Karl Loatmann to be transferred Ken's son's new astronomy club in South Carolina.

New Business:

- (none)

Observing Reports:

- **Lake Taghkanic Star Party** – 5 to 6 people at February club star party.
- **Winter Star Party in Florida** – Willie reports there were about 400 people there (smaller than usual) and fewer vendors. There were two 32 inch scopes! 2-3 good observing nights.

Visitors/New Members:

There were over 60 people in attendance.

The meeting was adjourned at 7:45 PM. The next meeting is on March 15th. The program that followed was "Beyond Biocentrism" by Bob Berman.

Submitted by James Rockrohr, March 12, 2016.

From the President:

Treasurer needed

As most of you know, Ken Bailey who has served as our treasurer the past few years will be moving to warmer climes sometime this year. We are in need of a new treasurer, and the sooner the better so that Ken can mentor the new person into the job, and arrange to have signatures transferred, etc.

Please contact Ken <fleetwizard01@yahoo.com> if you would be willing to serve the club in this capacity.

2017 Eclipse offer

There is a total solar eclipse in August 2017. Lodging has already been sold out for years along the path of totality.

Bob Berman will be leading a tour to Casper WY, and has made this offer:

This tour is filling up, but we'd love to have you and members of the MHAA.

We've done 7 totalities, and seen all 7. This is partly luck, of course, but also we plan carefully and ONLY go to locations with high probabilities of success. That's why we skipped the totalities of 2015 and 2016 -- we don't want sad faces.

Right now, I can offer MHAA members a \$125 discount apiece if you can get a bunch to sign up all at once. In another few months, when the tour gets over 50% full, she won't offer that any more.

Contact Bob at Skymanbob@aol.com if interested.

2015 Awards

I announced our awards at our Annual Dinner last month, but most of the recipients were not there to receive them. I will be giving them out as they show up for meetings, but I would like to acknowledge them now.

The Night Sky Network Award is given to those who give their time, energy, equipment and gas (or in at least one case diesel) to outreach events. The following people did six or more events in 2015 and receive a certificate and pin from NASA's Night Sky Network.

Chris McCarthy
Jack Chastain
Joe Macagne
Karen Bailey
Ken Bailey
Rick Versace
Willie Yee



Our thanks also to those who attended fewer events, but contributed what they were able.

The pin, which is a very attractive design, is somewhat embarrassing, since it was based on the Mars Insight Mission, which was recently postponed for about two years and will not launch in 2016. Oh well.

I made my own award this year, the President's Award, to honor those club members who do the work of keeping the club going. Most of their work is unseen, sometimes not much fun, but essential to the functioning of our club. This club can function without me, as it often does, but if these people were not doing the nitty-gritty work of the club, we would cease to exist in short order. Therefore, I give the President's Award to

Ken Bailey, for his work as Treasurer, and for serving as parks liaison. He also keeps and manages our library of books, videotapes, and DVD.

Candace Wall, who in addition to her duties as Vice President, especially coordinating our speakers, has served as Outreach Coordinator, and helped with archiving club-related materials.

Rick Versace, who turns out our newsletter every month.

Caryn Sobel, who continues to serve as our Membership Coordinator.

Paul Chauvet, who serves as our Publicity Director, Web Manager, and also creates our yearly Star Party Schedule.

Jim Rockrohr, our secretary, who faithfully records and transmits our meeting minutes each month.

Again, many thanks and congratulations to all our award winners!

Dr. Willie Yee
MHAA President





Visit spaceplace.nasa.gov to explore space and earth science!

Gravitational Wave Astronomy Will Be The Next Great Scientific Frontier

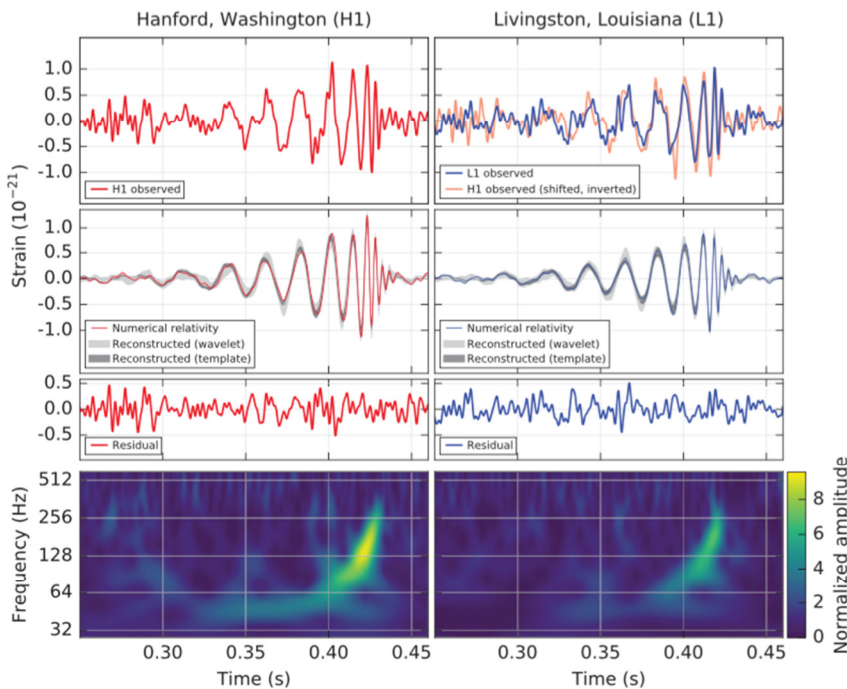
By Ethan Siegel

Imagine a world very different from our own: permanently shrouded in clouds, where the sky was never seen. Never had anyone see the Sun, the Moon, the stars or planets, until one night, a single bright object shone through. Imagine that you saw not only a bright point of light against a dark backdrop of sky, but that you could see a banded structure, a ringed system around it and perhaps even a bright satellite: a moon. That's the magnitude of what LIGO (the Laser Interferometer Gravitational-wave Observatory) saw, when it directly detected gravitational waves for the first time.

An unavoidable prediction of Einstein's General Relativity, gravitational waves emerge whenever a mass gets accelerated. For most systems -- like Earth orbiting the Sun -- the waves are so weak that it would take many times the age of the Universe to notice. But when very massive objects orbit at very short distances, the orbits decay noticeably and rapidly, producing potentially observable gravitational waves. Systems such as the binary pulsar PSR B1913+16 [the subtlety here is that binary pulsars may contain a single neutron star, so it's best to be specific], where two neutron stars orbit one another at very short distances, had previously shown this phenomenon of orbital decay, but gravitational waves had never been directly detected until now.

When a gravitational wave passes through an objects, it simultaneously stretches and compresses space along mutually perpendicular directions: first horizontally, then vertically, in an oscillating fashion. The LIGO detectors work by splitting a laser beam into perpendicular "arms,"

letting the beams reflect back and forth in each arm hundreds of times (for an effective path lengths of hundreds of km), and then recombining them at a photodetector. The interference pattern seen there will shift, predictably, if gravitational waves pass through and change the effective path lengths of the arms. Over a span of 20 milliseconds on September 14, 2015, both LIGO detectors (in Louisiana and Washington) saw identical stretching-and-compressing patterns. From that tiny amount of data, scientists were able to conclude that two black holes, of 36 and 29 solar masses apiece, merged together, emitting 5% of their total mass into gravitational wave energy, via Einstein's $E = mc^2$.



During that event, more energy was emitted in gravitational waves than by all the stars in the observable Universe combined. The entire Earth was compressed by less than the width of a proton during this event, yet thanks to LIGO's incredible precision, we were able to detect it. At least a handful of these events are expected every year. In the future,

different observatories, such as NANOGrav (which uses radiotelescopes to the delay caused by gravitational waves on pulsar radiation) and the space mission LISA will detect gravitational waves from supermassive black holes and many other sources. We've just seen our first event using a new type of astronomy, and can now test black holes and gravity like never before.

Image credit: Observation of Gravitational Waves from a Binary Black Hole Merger B. P. Abbott et al., (LIGO Scientific Collaboration and Virgo Collaboration), Physical Review Letters 116, 061102 (2016). This figure shows the data (top panels) at the Washington and Louisiana LIGO stations, the predicted signal from Einstein's theory (middle panels), and the inferred signals (bottom panels). The signals matched perfectly in both detectors.

2016 Star Party Schedule

Date	Time	Sunset	End Civil Twilight	Nearest New Moon
January 8th	7:30 PM	4:42 PM	5:13 PM	January 9th
February 5th	7:30 PM	5:16 PM	5:45 PM	February 8th
March 11th	7:30 PM	5:59 PM	6:26 PM	March 8th
April 8th	8:00 PM	7:30 PM	7:58 PM	April 7th
May 6th	8:30 PM	8:01 PM	8:32 PM	May 6th
June 10th	8:30 PM	8:31 PM	9:05 PM	June 4th
July 1st	8:30 PM	8:35 PM	9:09 PM	July 4th
July 29th	8:30 PM	8:17 PM	8:49 PM	August 2nd
September 2nd	8:00 PM	7:27 PM	7:56 PM	September 1st
September 30th	7:30 PM	6:38 PM	7:06 PM	September 30th
October 28th	7:30 PM	5:55 PM	6:23 PM	October 30th
November 25th	7:30 PM	4:28 PM	4:59 PM	November 29th
December 30th	7:30 PM	4:34 PM	5:06 PM	December 29th

Directions To The Star Party Site—

[Lake Taghkanic State Park](#) is in the town Ancram, NY. The park entrance is on the Taconic Parkway 10 minutes north of the exit used for Wilcox park.

Star Parties at Lake Taghkanic are held in the West Parking lot, next to the beach. The skies are darker than in Wilcox, with less stray light to deal with. The horizon is also much lower, especially to the south and east, making many more targets possible.

IMPORTANT: all events at Lake Taghkanic State Park require an **RSVP** which includes license plate number of the car you are bringing (please do so via [Meetup](#)). The park is patrolled by state police, and all non registered cars will be ticketed and risk our use of the park.

General Information:

- ♦ For the foreseeable future, all indoor meetings will be held on the 3rd Tuesday of each month in Coykendall Science Bldg., SUNY New Paltz (directions above) at 7:30 PM. All indoor events are FREE! All are welcome. The presentations are generally geared towards teenagers and up. For more information, call the Club Hotline.

- ♦ Dates listed for star parties are the primary dates. The rain date is the following night unless otherwise noted. Only one session is held for a given weekend, usually on the primary date, Friday, unless postponed (usually due to inclement weather) to the backup date, Saturday. Exceptions to this are noted in the “Scheduled Events” section above.
- ♦ All outdoor events are FREE! All are welcome. If you bring small children, it is your responsibility to keep a close eye on them. Please do not bring white-light flashlights. Instead, bring a red astronomer’s flashlight or an ordinary flashlight covered with several layers of red cellophane. If in doubt about the weather, check the status of the event at www.midhudsonastro.org.