



The Meridian

Newsletter of the Quad Cities Astronomical Society • June-July 2014

Upcoming QCAS Events

August 2, Davenport Soccer Field Complex star viewing, west of Davenport Municipal Airport, co-sponsored by the Davenport Park and Recreation department.

Upcoming Meetings

Due to some scheduling misunderstandings, the Library dropped a few of our meeting dates. Our next meeting is August 4th at 6:30pm. *We may need to do some business*, since we presently lack a room for 8/18.

Meeting Notes

From June 16. [by John Baker] Meeting called to order by John Baker at 6:40pm. The meeting was attended by 11 members. Members included: John Baker, Dana Taylor, Karl Adlon, Cecil Ward, Sam Snow, Debbie Ven Horst-Snow, Al Cattoir, Brian Haysbrook, Matt Neilssen, Dr. Mitchell and Bruce Brooker.

Agenda

Facilities. Little club interest was generated by B. Mack's desire to sell a 12" Meade Light Bridge Dobsonian telescope and various other items.

There was a long discussion on how to go about raising the 16" telescope another 36" and permanently mount it. [Subsequent e-mails and discussions have ensued. See story inside this issue. - ed.]

Bruce Brooker and Dana Taylor put roof flashing along the West and East side of the roll-off roof to try to keep the rain out.

Event Report. Bruce described that about 30 boy scouts attended Dana's event and they were all very well behaved and had a great time looking at Saturn, Jupiter and Mars.

Presentations. Dana tried to show a Hubble Podcast but had technical difficulties so the group discussed a few things like how there are two black holes orbiting each other (maybe a super-massive black hole, see story inside - ed.) in M87 which create a huge jet that might possibly be the most powerful object in the known universe.

Dr. Mitchell explained how Type I super nova are created by a dwarf (neutron?) star rotating around another star sucking up mass until it reaches a certain critical mass and explodes thus can be used for measuring distances since they always behave the same.

From July 21. [by John Robbins] Meeting very loosely came together around 6:45, once Bett Library found a place for us (seems our 1st and 3rd Monday schedule mixed them up).

Attended by 7 members. Bruce Brooker, Karl Adlon, Dr. Robert Mitchell, Tom Bullock, John Robbins, John Baker and a new member, Christian Allen. Welcome Christian! Your advanced meteorological knowledge is a great boon for the club!

Treasurer's Report: Balance is \$1470.63, after having paid \$189.81 for the new 16" pillar.

No set agenda. The club discussion centered around the height of the new 16" pillar. See story inside.

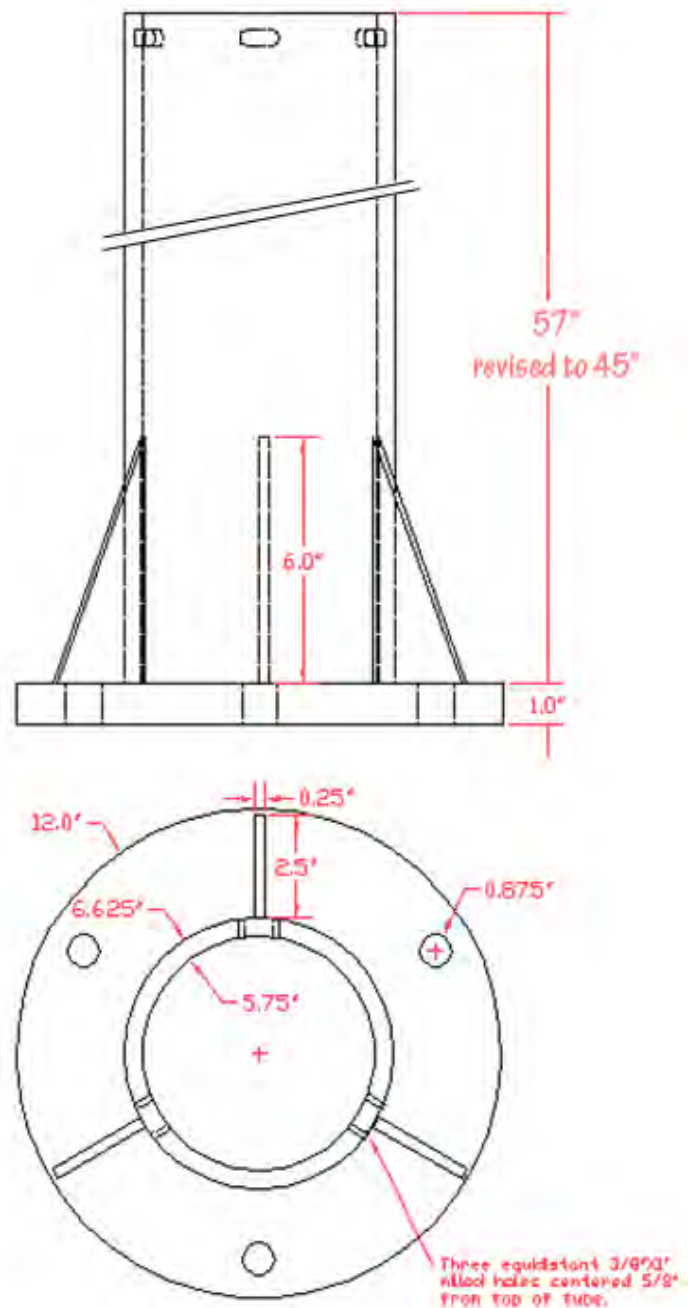
New Permanent Pillar for I6"

At the QCAS business meeting in mid-May, Bruce Brooker put forth a proposal for the Society to replace the set of legs that the Meade I6" Lightbridge currently sits upon with a more permanent and stable pillar to be mounted on the dome's seismic mass.

Those who have tried to use the I6" as a platform for astrophotography have not been entirely pleased with their results. Several observers have noted issues with polar alignment plaguing their enjoyment of the instrument.

Soon after the meeting, Dana Taylor and Bruce created a set of drawings for the Pillar. Actual dimensions are 7/16" thick pillar and 3/4" thick base, as seen at right. The base plate holes are centered on a 5" radius.

Several e-mail exchanges helped to refine details and Bruce worked with fabricators (notably Chad Smith) at Lewis Industrial Services in Muscatine. They agreed to donate materials with the society to cover labor costs. The full fabrication amounted to just over \$200.00.



At left is a photo of the base plate. The pillar mounting bolts (three @ 7" long x 3/4" dia) are designed to allow for precise levelling of the pillar, mount and instrument. One of the base mounting bolts will be set close to true north, with the other two set perpendicularly in order to provide N/S and E/W leveling adjustment. Holes at the top of the pillar are slotted which allows for mount yaw adjustment (approx. $\pm 4^\circ$) in the horizontal plane. Installation is planned for later, this summer.



Entire Star Cluster Thrown Out of its Galaxy

The galaxy known as M87 has a fastball that would be the envy of any baseball pitcher. It has thrown an entire star cluster toward us at more than two million miles per hour. The newly discovered cluster, which astronomers named HVGC-I, is now on a fast journey to nowhere. Its fate: to drift through the void between the galaxies for all time.

“Astronomers have found runaway stars before, but this is the first time we’ve found a runaway star cluster,” says Nelson Caldwell of the Harvard-Smithsonian Center for Astrophysics. Caldwell is lead author on the study, which will be published in *The Astrophysical Journal Letters* and is available online.

The “HVGC” in HVGC-I stands for hypervelocity globular cluster. Globular clusters are relics of the early universe. These groupings usually contain thousands of stars crammed into a ball a few dozen light-years across. The Milky Way galaxy is home to about 150 globular clusters. The giant elliptical galaxy M87, in contrast, holds thousands.

It took a stroke of luck to find HVGC-I. The discovery team has spent years studying the space around M87. They first sorted targets by color to separate stars and galaxies from globular clusters. Then they used the Hectospec instrument on the MMT Telescope in Arizona to examine hundreds of globular clusters in detail.

A computer automatically analyzed the data and calculated the speed of every cluster. Any oddities were examined by hand. Most of those turned out to

be glitches, but HVGC-I was different. Its surprisingly high velocity was real.

“We didn’t expect to find anything moving that fast,” says Jay Strader of Michigan State University, a co-author on the study.

How did HVGC-I get ejected at such a high speed? Astronomers aren’t sure but say that one scenario depends on M87 having a pair of supermassive black holes at its core. The star cluster wandered too close to those black holes. Many of its outer stars were plucked off, but the dense core of the cluster remained intact. The two black holes then acted like a slingshot, flinging the cluster away at tremendous speed.

HVGC-I is moving so fast that it is doomed to escape M87 altogether. In fact, it may have already left the galaxy and be sailing out into intergalactic space.

Background

M87, source of the hypervelocity cluster HVGC-I, is a king among galaxies. This supergiant elliptical galaxy weighs as much as 6 trillion Suns, making it one of the most massive galaxies in the nearby universe.

The discovery of HVGC-I suggests that the core of M87 holds not one but two supermassive black holes. This must be the result of a long-ago collision between two galaxies, which merged to form a single giant galaxy. The same fate awaits our own Milky Way, which will collide with the Andromeda galaxy in a few billion years to create an elliptical galaxy that astronomers have dubbed Milkomeda.

This story comes from Harvard Center for Astrophysics, issued as a news release on Wednesday, April 30, 2014.

Weighing the Milky Way



Does the Milky Way look fat in this picture (above)? Has Andromeda been taking skinny selfies (right)? It turns out the way some astrophysicists have been studying our galaxy made it appear that the Milky Way might be more massive than its neighbor down the street, Andromeda.

Not true, says a study published in the journal *Monthly Notices of the Royal Astronomical Society* by an international group of researchers, including Matthew Walker of Carnegie Mellon University's McWilliams Center for Cosmology. In the paper, they demonstrate a new, more accurate method for measuring the mass of galaxies. Using this method, the researchers have shown that the Milky Way has only about half the mass of its neighbor, the Andromeda Galaxy.

In previous studies, researchers were only able to estimate the mass of the Milky Way and Andromeda based on observations made using their smaller satellite dwarf galaxies. In the new study, researchers culled previously published data that contained information about the distances between the Milky Way, Andromeda and other close-by galaxies — including those that weren't satellites — that reside in and right outside an area referred to as the Local Group.

Andromeda Galaxy. Galaxies in the Local Group are bound together by their collective gravity. As a result, while most galaxies, including those on the outskirts of the Local Group, are moving farther apart

due to expansion, the galaxies in the Local Group are moving closer together because of gravity. For the first time, researchers were able to combine the available information about gravity and expansion to complete precise calculations of the masses of both the Milky Way and Andromeda.

“Historically, estimations of the Milky Way’s mass have been all over the map,” said Walker, an assistant professor of physics at Carnegie Mellon. “By studying two massive galaxies that are close to each other and the galaxies that surround them, we can take what we know about gravity and pair that with what we know about expansion to get an accurate account of the mass contained in each galaxy. This is the first time we’ve been able to measure these two things simultaneously.”

By studying both the galaxies in and immediately outside the Local Group, Walker was able to pinpoint the group’s center. The researchers then calculated the mass of both the ordinary, visible matter and the invisible dark matter throughout both galaxies based on each galaxy’s present location within the Local Group. Andromeda had twice as much mass as the Milky Way, and in both galaxies 90 percent of the mass was made up of dark matter.

The study was supported by the UK’s Science and Technology Facilities Council and led by Jorge Peñarrubia of the University of Edinburgh’s School of Physics and Astronomy. Co-authors include Yin-Zhe Ma of the University of British Columbia and Alan McConnachie of the NRC Herzberg Institute of Astrophysics.

Measurements you may not have known about

1. Ratio of an igloo's circumference to its diameter = Eskimo Pi
2. 2000 pounds of Chinese Soup = Won ton
3. 1 millionth of a mouthwash = 1 microscope
4. Time between slipping on a peel and smacking the pavement = 1 bananosecond
5. Weight an evangelist carries with God = 1 billigram
6. Time it takes to sail 220 yards at 1 nautical mile per hour = Knotfurlong
7. 365.25 days of drinking low-calorie beer = 1 Lite year
8. 16.5 feet in the Twilight Zone = 1 Rod Sterling
9. Half a large intestine = 1 semicolon
10. 1,000,000 aches = 1 megahurtz
11. Basic unit of laryngitis = 1 hoarsepower
12. Shortest distance between two jokes = a straight line
13. 2000 mockingbirds = two kilomockingbirds
14. 1 kilogram of falling figs = 1 Fig Newton
15. 1000 ccs of wet socks = 1 literhosen
16. 4 nickels = 2 paradigms

Celestial Calendar

- Aug 02 06:26 Moon at Ascending Node
- 02 08:27 Spica 2.3°S of Moon
- 03 05:02 Mars 2.2°S of Moon
- 03 19:50 FIRST QUARTER MOON
- 04 05:54 Saturn 0.0°N of Moon: Occn.
- 06 17:29 Venus 6.5°S of Pollux
- 08 11 Mercury at Superior Conjunction
- 10 12:43 Moon at Perigee: 356897 km
- 10 13:09 FULL MOON
- 12 19 Perseid Meteor Shower
- 14 19:18 Moon at Descending Node
- 17 07:26 LAST QUARTER MOON
- 18 00:05 Venus 0.9°S of Beehive
- 18 01:48 Jupiter 1.1°S of Beehive
- 18 12:46 Aldebaran 1.6°S of Moon
- 24 01:09 Moon at Apogee: 406523 km
- 25 09:13 NEW MOON
- 27 00:33 Mercury 3.4°N of Moon
- 29 08 Neptune at Opposition
- 29 08:14 Moon at Ascending Node
- 29 14:08 Spica 2.5°S of Moon
- 31 14:21 Saturn 0.4°S of Moon: Occn.
- 31 18:43 Mars 4.1°S of Moon

All times are CDT.

List from www.astropixels.com



QCAS Meetings: First Monday (workshop) at 6:30pm, and third Monday, (business), at 6:30pm, Bettendorf Library, 2950 Learning Campus Dr., off of 18th Street, Bettendorf.

QCAS Correspondence:

Please send to the society at:
P.O. Box 3706, Davenport, IA, 52808.
Members are welcome and encouraged to submit articles for The Meridian.
Submit Any and all interesting items (via e-mail) to: John Robbins or Dale Hendricks.

QCAS Officers and Contacts:

President: Dale Hendricks	Vice-president: Craig Cox
Secretary: John Robbins	Treasurer: John Baker
Director: Dana Taylor	Facilities: John Baker
Web Master: Dana Taylor	Outreach: Matt Nielssen
Programming: Jim Rutenbeck	