



# The Meridian

Newsletter of the Quad Cities Astronomical Society • July 2013

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## Meeting Notes

John Robbins, Secretary

**June 15.** Meeting called to order at 7:05pm.

14 in attendance: Dale Hendricks, Dana Taylor, John Robbins, Mitch White, Robert Mitchell, Bruce Brooker, Jim Rutenbeck, Al Cattoir, Todd Weets, Karl Adlon, Cecil Ward, Craig Cox, Steve VanHyffe and David Heard. John Baker was unable to attend due to death in the family. John was in our thoughts several times, during the meeting.

### Agenda

1. Treasurer's Report: The current balance is \$2,153.75. Recovering to levels before last year's dome expenses.
2. Facilities Report: Have been in contact with the roofing supplier for CCCB and inquiries have been made regarding materials to wrap the dome building (classic ribbed sheet metal in white). Expenses and spending for the dome are under control. Concept for exterior agreed to by vote and will be taken up by the board.
3. Craig Cox wanted to announce that his Meade 16" f/4.5 Starfinder Newtonian is available. Scope will be too big for Craig to handle. This spurred some discussion on what scope will be placed in the new dome. Decision not yet made — recommendation from committee still forthcoming.
4. Secretary Position: Filling the vacancy to replace Jim Rutenbeck, John Robbins volunteered to accept the duties of society secretary. Unanimous vote ensued, although threats were leveled (of humorous nature!) that whoever was the last person to arrive at the meeting might be given the position.
5. By-laws were discussed only briefly, if no one had expressed an interest in the position of secretary, some changes may have needed to be made. Also, short discussion was made whereby questions regarding the non-profit status of the club might come into jeopardy if by-laws were changed too drastically.
6. Visit by Keith Townsley who is organizing a fall camporee at the Wapsi Environmental Center on the weekend of 27-29 of September. Expectation is that 20-30 boy scouts (6th grade through high school ages) will attend. Dana Taylor offered to act as a point of contact to coordinate a star party on Saturday night, Sept. 28th.
7. Presentation: Karl again provided a very nice presentation which included a video of the Cassini flyby of Saturn showing the motion of the "spokes" in the rings. Their origin is not yet completely understood, but the leading theory regarding the spokes' composition is that they consist of microscopic dust particles suspended away

from the main ring by electrostatic repulsion, as they rotate almost synchronously with the magnetosphere of Saturn. (Explanation from Wiki.)

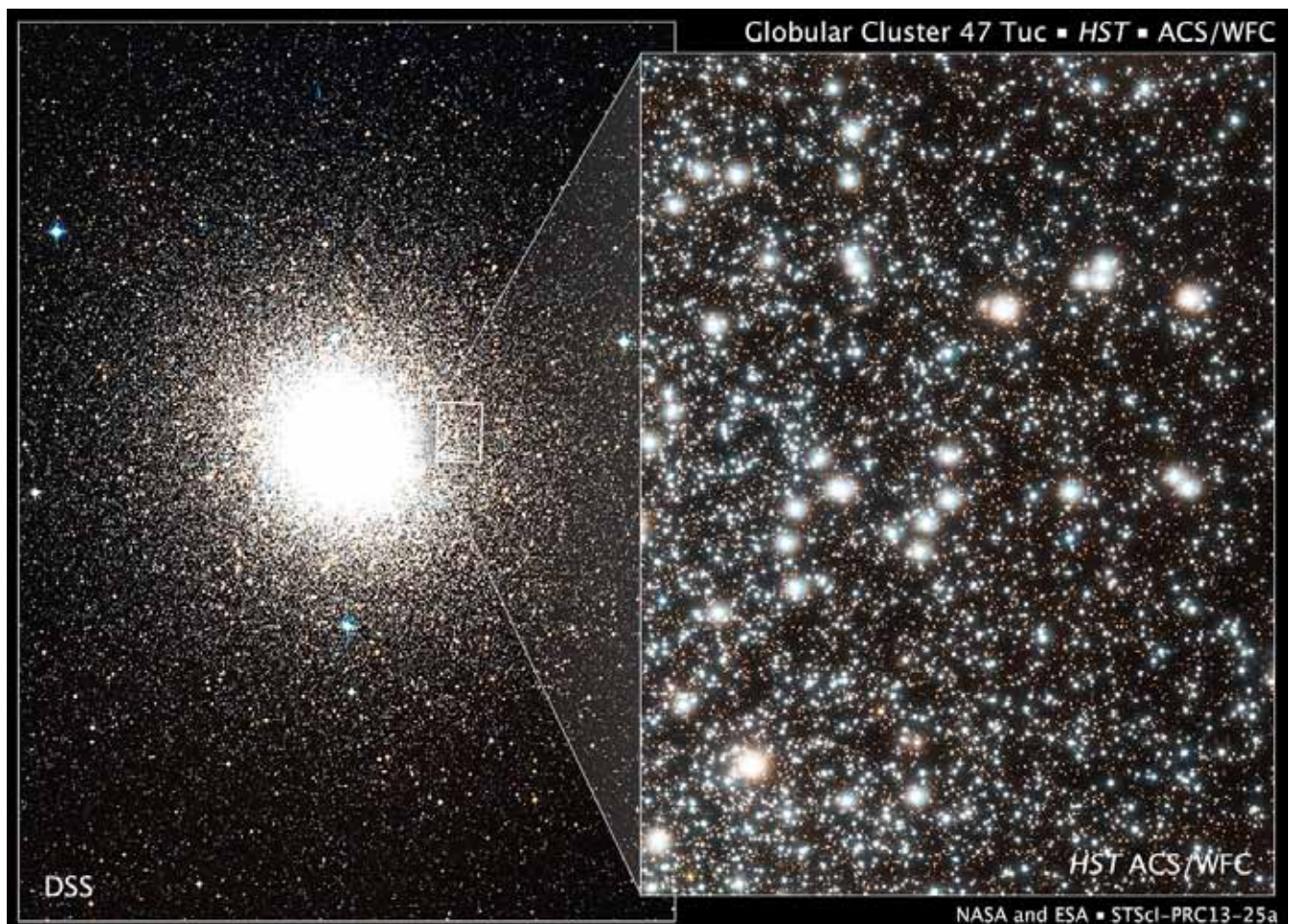
Karl also showed a very fine series of images of planetary nebulae, showing that their shapes can vary quite widely from largely spherical to wildly bi-polar prolate ellipsoids. A planetary nebula consists of an expanding glowing shell of ionized gas ejected from a star late in its life. Planetary nebula may result from the death of intermediate and low mass stars from eight down to 0.8 solar masses.

8. The club would appreciate anyone offering to develop and give 15-20 minute presentations. Sign up with Dale Hendricks if you could offer to make a presentation at the September meeting.

## NASA'S HUBBLE SHOWS LINK BETWEEN STARS' AGES AND THEIR ORBITS

WASHINGTON, NASA news release 13-197, July 18, 2013 — Astronomers using NASA's Hubble Space Telescope have determined the orbital motion of two distinct populations of stars in an ancient globular star cluster, offering proof they formed at different times and providing a rare look back into the Milky Way galaxy's early days.

Researchers led by Harvey Richer of the University of British Columbia in Vancouver combined recent Hubble observations with eight years' worth of data from the telescope's archive to determine the motions of the stars in the globular cluster 47 Tucanae, which is located about 16,700 light-years away in the southern constellation Tucana.



The analysis enabled researchers, for the first time, to link the movement of stars within the cluster with the stars' ages. The two populations in 47 Tucanae differ in age by less than 100 million years.

"When analyzing the motions of stars, the longer the time baseline for observations, the more accurately we can measure their motion," said Richer. "These data are so good, we can actually see the individual motions of the stars within the cluster. The data offer detailed evidence to help us understand how various stellar populations formed in such clusters."

The Milky Way's globular clusters are the surviving relics from our galaxy's formation. They offer insights into the early history of our galaxy. 47 Tucanae is 10.5 billion years old and one of the brightest of our galaxy's more than 150 globular clusters. The cluster measures about 120 light-years wide.

Previous spectroscopic studies revealed many globular clusters contain stars of varying chemical compositions, suggesting multiple episodes of star birth. This Hubble analysis supports those studies, but adds the stars' orbital motion to the analysis.

Richer and his team used Hubble's Advanced Camera for Surveys to observe the cluster in 2010. They combined those observations with 754 archival images to measure the change in position of more than 30,000 stars. Using these data, they could discern how fast the stars move. The team also measured the stars' brightness and temperatures.

This stellar archaeology identified the two distinct populations of stars. The first population consists of redder stars, which are older, less chemically enriched, and orbiting in ran-

dom circles. The second population consists of bluer stars, which are younger, more chemically enhanced, and moving in more elliptical orbits.

The lack of heavier elements in the redder stars reflects the initial composition of the gas that formed the cluster. After the most massive of these stars completed their stellar evolution, they expelled gas enriched with heavier elements back into the cluster. This gas collided with other gas and formed a second, more chemically enriched generation of stars that was concentrated toward the cluster center. Over time these stars moved slowly outward into more elliptical orbits.

This is not the first time Hubble has revealed multiple generations of stars in globular clusters. In 2007, Hubble researchers found three generations of stars in the massive globular cluster NGC 2808. But Richer's team is the first to link stellar dynamics to separate populations.

The team's results are published in the July 1 issue of *The Astrophysical Journal Letters*.

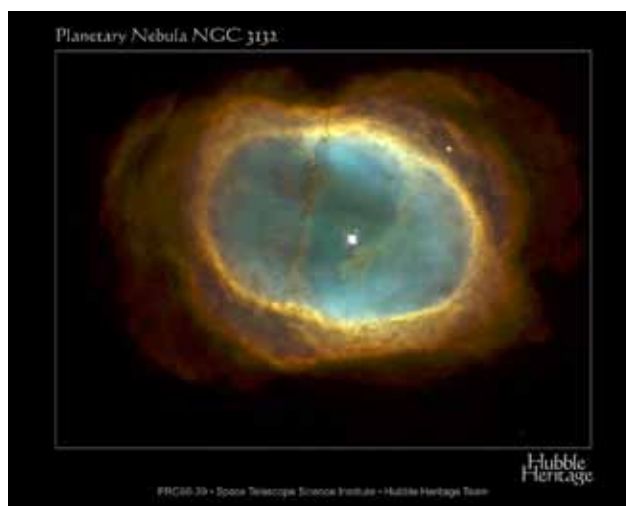
The Hubble Space Telescope is a cooperative project between NASA and the European Space Agency. NASA's Goddard Space Flight Center in Greenbelt, Md., manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore, Md., conducts Hubble science operations. STScI is operated by the Association of Universities for Research in Astronomy Inc., in Washington.



# QCAS Calendar

Mo	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
J	21 Mars 0.8° from planet Jupiter	22 <b>Full Moon</b>	23	24	25	26	27 <b>QCAS Star Party / Open House</b>
U	28	29 <b>Last Quarter Moon</b>	30 Mercury at greatest elongation 19.6° west of sun	31	1	2	3 <b>QCAS Members' Star Party</b>
A	4	5	6 <b>NEW MOON</b>	7	8	9	10 <b>Menke Star Party</b>
U	11 <b>Perseid meteor shower tonight</b>	12 <b>Perseid meteor shower tonight</b>	13	14 <b>First Quarter Moon</b>	15	16	17
G	18	19 <b>7PM - QCAS Meeting</b>	20	21 <b>Full Moon</b>	22	23	24
A	25	26 Neptune at opposition (28.973 AU from Earth)	27	28 <b>Last Quarter Moon</b>	29	30 <b>Prairie Skies S.P. Deadline Tomorrow</b>	31 <b>QCAS Star Party / Open House</b>
S	1	2 <b>Labor Day</b>	3	4	5 <b>NEW MOON</b>	6	7 <b>Menke Star Party</b>
S	8 Mars passes through Beehive Star Cluster, M44	9	10	11	12 <b>First Quarter Moon</b>	13	14
S	15	16 <b>7PM - QCAS Meeting</b>	17	18	19 <b>Full Moon</b>	20	21

Note: Days of QCAS and QCAS-supported events are shaded BLUE.



## 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 Niessen  
 Programming: Jim Rutenbeck

## 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 item (via e-mail) to:  
 John Robbins or Dale Hendricks.