The Meridian

The newsletter of the Quad Cities Astronomical Society

November 2011

Secretary's Notes

Dale Hendricks

Members in attendance:

Joe Bannon	Chris Hebel	Dana Taylor	Brian Haysbrook	Karl Adlon
Jim Rutenbeck	Ken Boquist	Steve VanHefte	Craig Cox	Cecil Ward
Bruce Brooker	Dale Hendricks	Jeff Struve	Gary Charnoski	Teresa Pearce**

** New attendee Welcome, Teresa - great to have you with us for the meeting.

Treasurer's report: Craig reported a total of $2,432.23 in the club account. There are 13 paid members for 2012 - 18 have yet to pay membership dues for next year. (Craig reported that Dr. NIdal Harb had contacted him and wanted to receive an email note/invoice and would then renew his membership. Dale sent the email to Dr. Harb Monday 28 November.)

Dale addressed members' concerns about the distribution and mailing of The Meridian. It was posted on the web site last month but several members asked to receive it by email distribution. It will now be posted and mailed as requested.

Jim Rutenbeck mentioned selling Dining Club Ticket Books as a way to raise money. Books sell for $35.00 with $10.00 going to the Club and $25.00 to the group selling the books.

Joe Bannon then mentioned a solicitation the QCAS received about selling stencil kits for ceiling viewing of celestial panoramas. Proceeds go to physically/mentally handicapped children. It was agreed that we would put information on the sales of these kits in the Meridian.

As it is the season for winter viewing there was a conversation about winter clothing for observing. All agreed that no matter how warmly a person is dressed it is never quite enough. Personal experience supports this contention.

There was a short conversation about the possible need to change the combination on locks at the observatory - current combination may have been compromised.

It was also mentioned that there would be no open houses the months of November, December, January, February and March. However, members can bring family and friends. Open houses resume in April.

Joe brought up an idea mentioned in an earlier meeting that we may want to set up a scope on the field of the old Geifman Grocery Store for people at the library who may be interested in some "casual" viewing. Dale will contact the library to determine the feasibility of doing this and, if feasible, how the library will advertise the availability of viewing.

Joe then gave a brief update/report on Astronomy Day at the Bettendorf Museum. Craig, Cecil and Jeff were there to "educate" the people who were there to take advantage of the set up. Good jobs, guys, and for those of you who have not contributed your time for this event it is not overwhelming but it is rewarding.

There was a short conversation regarding the Boy Scouts and members were asked about their contacts. Cecil knows people at Scout HQ and will contact them for interest.

Additionally, the Bettendorf Science Department was identified as a potential group to be contacted for their interest.

It was reported the telrad at the observatory had "died" and the batteries need to be changed out. In the course of this conversation it was mentioned that there was a need for two or three ladders to help in working with the turnbuckles as well as a new tarp but one that doesn't trap moisture.

Special Interest Section - Famous People in Astronomy (provided by D. Hendricks)

Nicolaus Copernicus (1473–1543)

Polish astronomer and mathematician who, as a student, studied canon law, mathematics and medicine. He then became interested in astronomy and published an early description of his "heliocentric" model of the solar system in *Commentariolus* (1512). In this model, the sun was actually not exactly the center of the solar system, but was slightly offset from the center using a device invented by Ptolemy known as the *equant point.* The idea that the Sun was the center of the solar system was not new but Copernicus also worked out his system in full mathematical detail. Even though the mathematics in his description was not any simpler than Ptolemy's, it required fewer basic assumptions. By postulating only the rotation of the Earth, revolution about the sun and tilt of Earth's rotational axis, Copernicus could explain the observed motion of the heavens. However, because Copernicus retained circular orbits, his system required the inclusion of epicycles. Unfortunately, out of fear that his ideas might get him into trouble with the church, Copernicus delayed publication of them.

Copernicus adapted physics to the demands of astronomy, believing that the principles of Ptolemy's system were incorrect, not the math or observations. He was the first person in history to create a complete and general system, combining mathematics, physics and cosmology. (Ptolemy, for instance, had treated each planet separately.) Copernicus's system was taught in some universities in the 1500s but had not permeated the academic world until approximately 1600. Some people, among whom John Donne and William Shakespeare were the most influential, feared Copernicus's theory, feeling that it destroyed hierarchal natural order which would in turn destroy social order and bring about chaos. Indeed, some people used Copernicus's theory to justify radical theological views.

Before Copernicus formulated his theory of the solar system, astronomy in Europe had stagnated. After the *Almagest* had been translated into Latin, European astronomers proposed no new theories, attempting instead to refine the flawed system already laid out by Ptolemy. The astronomy textbook used for teaching was still *The Sphere*, the same book that had been in use since the 1200s. Rather than formulating new theories, astronomers had busied themselves in "saving appearances," which consisted of trying to patch up Ptolemy's cumbersome and inaccurate model. Copernicus, however, wiped the slate clean in a single broad stroke and proposed a fundamentally different model in which

the planets all circled the Sun in *De Revolutionibus Orbium Coelestium.* While radically different from Ptolemy's model, Copernicus's heliocentric theory was hardly an original idea. Similar theories had been proposed by Aristarchus as early as the third century B. C., and Nicholas de Cusa, a German scholar, had independently made the same assertion in a book he published in 1440.

In his belief that his theory was an accurate description of nature rather than just a mathematical model, Copernicus was therefore not truly revolutionary. What was a little revolutionary was that Copernicus worked out his system in full mathematical detail in *De Revolutionibus.* By doing this, Copernicus went a step beyond Ptolemy, de Cusa, and Aristarchus. Ptolemy had regarded his theory as simply a mathematic tool for calculation, having no physical basis. On the other side of the coin, de Cusa and Aristarchus had proposed a purely physical model, not endeavoring to mathematically investigate its consequences. Copernicus's most significant achievement was his combination of mathematics and physics, adapting physics to conform to his view of astronomical truth.

This achievement alone hardly qualifies as a "revolution." Copernicus offered mathematics which were every bit as entangled as Ptolemy's, and because he retained circular orbits, his system required the inelegant inclusion of epicycles and their accompanying complication. To Copernicus's credit, although his description was not any simpler than Ptolemy's, it did require fewer basic assumptions. In addition, Copernicus's theory explained some problems, such as the reason that Mercury and Venus are only observed close to the Sun (their orbits always kept them nearer the sun than Earth) and Mars's retrograde motion (the Earth, traveling in its smaller orbit, overtakes Mars, causing Mars to appear to change direction and move backward relative to distant "fixed" stars).

However, like Ptolemy, Copernicus could still not explain variations in the brightness of Venus. He was the first person in history to create a complete and general system, combining mathematics, physics and cosmology. Yet, by themselves Copernicus's achievements do not constitute a revolution. Copernicus had been motivated to this theory by Neoplatonic and Pythagorean considerations. His reasoning seems to have been predominantly motivated by aesthetics. In his view, equally spaced planets in circular orbits would represent harmony in the universe. But Copernicus had made no observations and stated no general laws. His mathematics could describe the motion of the planets, but his theory was of a very ad hoc nature.

It took the accurate observational work of Brahe (Bray), the exhaustive mathematics of Kepler and the mathematical genius of Newton to take Copernicus's theory as a starting point and glean from it the underlying truths and laws governing celestial mechanics. Copernicus was an important player in the development of these theories, but his work would likely have remained in relative obscurity without the observational work of Brahe (Bray). It would have been discarded by the wayside, until subsequent investigation brought it back to light. It is likely, in fact, that given Kepler would have independently arrived at a heliocentric theory just in the process of interpreting Brahe's data, and the scientific revolution would have been born anyway. To a large extent, then, Copernicus has achieved his prominent place in history through what amounted to a lucky, albeit shrewd, guess. It is therefore more appropriate to view Copernicus's achievements as a preliminary step towards scientific revolution, rather than a revolution in itself.

Winter Observing Precautions – Karl Adlon

Sometimes seeing something in print reminds you of something you know. This isn't about dressing warmly. This is about keeping you and your vehicle out of trouble. After all, you don't want to be stranded at the observatory or between here and there.

So, now's a good time to check: tire pressures and tire tread; windshield washer fluid; antifreeze; battery condition and ignition system; emergency supplies and contacts.

Finally, I don't recommend observing out there alone.

Upcoming Celestial and Club Events

Mo	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
DEC	11	12	13	14 Thru the 28th – Good for seeing Mercury at Dawn	15	16 1857-E. E. Barnard born	17 1903-Wright Bros. first powered flight
DEC	18 Last-Quarter Moon	19 **7:00 QCAS Mtg @ Bettendorf Library**	20	21 Longest night of the year. Hanukka begins at sunset.	22	23	24 **NEW MOON**
DEC	25 *CHRISTMAS*	26 Dusk – pretty view of Venus and crescent Moon	27 1571-Johannes Kepler born	28	29	30	31 **QCAS Star Party**
JAN	1 First-Quarter Moon	2 Jupiter 5° south of the Moon	3 Europa and Ganymede shadow Jupiter tonight	4 Early morning – Quadratid meteors	5	6	7 1610-Galileo discovers Callisto, Europa & Io
JAN	8 1942-Stephen Hawking born	9 **Full Moon**	10	11	12	13 Venus 1.2° south of Neptune	14 Mars 9° north of the Moon
JAN	15	16 Last-Quarter Moon	17	18	19 1747-Johann Bode born	20 1930-Buzz Aldrin born	21
JAN	22	23 **NEW MOON** **7:00 QCAS Mtg @ Bettendorf Library**	24	25 Dusk – Venus ~8° from Moon	26	27 1967-Apollo 1 fire	28 **QCAS Star Party** 1986-Challenger accident

Jens-Wendt Observatory – Quad Cities Astronomical Society – Located at Sherman Park in Dixon, Iowa

Monsignor Menke Observatory – St. Ambrose University – Located at Wapsi River Environmental Education Center in Dixon, Iowa

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QCAS Contacts

Elected Officers		
President	Dana Taylor	dana@nelsontaylor.com
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All other contacts can be sent to the club at P.O. Box 3706, Davenport, IA, 52808.

Members are also reminded that anyone can submit articles for *The Meridian*. Submit articles to Dale Hendricks at dhusna68@mchsi.com.

I used ICE, as mentioned by Dana at the last meeting, for the image at right. –Karl