

# The Objective View

Newsletter of the Northern Colorado Astronomical Society

June 2010

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**Next Meeting: June 3 7:30 pm**

**Astrophotography, Film to Digital  
by Mr. Bob Webb**

**Club Business at 7:15 pm**

**Fort Collins Museum, 200 Mathews St  
Fort Collins CO**

Enter at East door:

[http://nightsky.jpl.nasa.gov/club-view-directions.cfm?Address\\_ID=2810](http://nightsky.jpl.nasa.gov/club-view-directions.cfm?Address_ID=2810)

**Club Brochure:**

[http://www.ncastro.org/Contrib/2009\\_Brochure.pdf](http://www.ncastro.org/Contrib/2009_Brochure.pdf)

**NCAS Programs**

July 1 Chip Koblunicky Wyoming Infrared Observatory  
Aug 12 Club picnic at Bobcat Ridge Natural Area, 6:30 pm

**NCAS Public Starwatch at Fossil Creek Reservoir**

June 19 8:30 pm, July 17 8:30 pm, Aug 20 8 pm

[http://www.co.larimer.co.us/naturalresources/fossil\\_creek.htm](http://www.co.larimer.co.us/naturalresources/fossil_creek.htm)

**City of Fort Collins Natural Area Program at Sunset**

Bobcat Ridge: Jun 10 7:30p, Sunset: Jul 8, Aug 12, Sep 9

<http://www.fcgov.com/naturalareas/finder/bobcat>

**Larimer County Parks Starwatch**

Flatiron Reservoir June 5 9p, July 10 9p, Jul 31 8:45p

Carter Lake June 12 9pm, Aug 14 8pm

Horsetooth Reservoir July 3 9 pm

**Dark Site Observing Dates**

June 11, 12 Keota or Foxpark site, ask FRAC

**Rocky Mountain National Park at Upper Beaver Meadows**

June 4, 18. July 2, 16, 30. August 13, 27.

<http://www.ncastro.org/Sites/RockyMtnNP.htm>

**Other Events**

Chamberlin Observatory Open House, 7 to 10 pm

Jun 19, Jul 17, Aug 14 303 871 5172

<http://www.du.edu/~rstencil/Chamberlin/>

Cheyenne Astronomical Society 7 pm June 18

<http://home.bresnan.net/~curranm/>

CSU Madison Macdonald Observatory Public Nights

On East Drive, north of Pitkin Street

Tuesdays after dusk if clear, when class is in session

Estes Park Memorial Observatory. 8:30 pm June 5 and 19. 7

pm. June 24 <http://www.angelsabove.org/>

Little Thompson Observatory, Berthoud open 7 pm June 18.

Dr. Suzanne Metlay, Citizen Science and Journalism.

<http://www.starkids.org>

Longmont Astronomical Society 7 pm June 17 at IHOP,  
2040 Ken Pratt Blvd.

<http://www.longmontastro.org/>

**May 6 Program: Chimney Rock, the Chaco Connection,  
by Drs. Steve and Irene Little**

Estes Park Memorial Observatory opened in March 2009. It is operated to use astronomy to engage K-12 students in math, physics and science. It is located by Estes Park High School and the school provides utilities and a T1 line. It is staffed by volunteers. It is in memorial to Thomas and Christian Connolly. The observatory is supported by donations to the Angels Above Foundation, and its calendar has been very active this year, hosting 3 or 4 nights a week in the peak summer season. The dome is home to a 12 inch Meade SCT on a Losmandy G 11 mount. The 60x40 foot warm room provides a comfortable site for classes and meetings of the Estes Valley Astronomical Society. It has a striking constellation wall. The group has received quite a few telescope donations, so can support classes and star parties onsite. For more information and reservations see: [www.angelsabove.org](http://www.angelsabove.org)

Chimney Rock is a site with Chacoan architecture about 70 miles east of Mesa Verde National Park in Southern Colorado. The sites were in use from 860 to 1130 AD. Chaco Canyon had small unit pueblos and pithouses from BC times until 950 AD. The Great House, Pueblo Bonito, was built from 920 to 1138 AD, then abandoned. It had 600 to 800 rooms. The years are accurately derived from tree ring profiles. About 200,000 trees were hand carried 45 miles. They were hauled green with their branches on. Buildings at Chaco Canyon have alignments with cardinal directions, solstices, and major and minor lunar standstills. Fajada Butte is home to the Sun Dagger. Three slabs of stone form slits which admit sunlight to a petroglyph below, and distinct patterns are formed at the equinoxes, and summer and winter solstices. There is also a hand petroglyph thought to represent Halley's Comet in 1066 AD, and a star by crescent moon thought to commemorate the Supernova of 1054 AD. Another petroglyph appears to show the total solar eclipse of 1097 AD. Chimney Rock is easily reached in a USFS site south of US 160. Escorted tours are provided. Solstice sunrise is the best for visiting the Sun Tower, Bedrock basin and seeing the Sunrise shadow viewed from the Great House. Equinox sunrise is viewed from Peterson ridge. The Moon's motions were understood in great detail. The site is designed to highlight the extremes of northern or southern moonrise. These are the the major standstills. The Observation Tower and the Guardhouse are aligned for these. Kim Malville in 1988 discovered the function of the Great Pueblo at Chimney Rock Pueblo. The sunrise at the summer solstice was not far enough, and neither was Venus. Only the moonrise at its 18.6 year extreme was far enough north to rise between the chimneys. A photo on the cover of Prehistoric Astronomy taken 8/3/1988, and next caught on 12/26/2004, are the two recent moonrises. Is the masonry Verdean or Chacoan? Recent excavation shows matches the Chaco structures. The Stone Basin is a 14 inch deep polished bowl for summer solstice observation at sunrise. It is near the Great Kiva on the mesa. A line runs from the basin along the N side of Chimney Rock Pueblo to the solstice. A line along the S side of the Pueblo may align with the 1054 AD Crab Nebula supernova. Dating indicates the structures were built just before the 1090s events of the Full Moon rising between the chimneys. There was also a total solar eclipse in 1097. The lack of pottery indicates the site was not for dwellings. It appears that severe drought until the 1450s forced the people to abandon the sites. Steve and Irene encourage visitors to enjoy these little known sites. Ed. Note: National Monument status has recently been proposed for Chimney Rock:

<http://www.preservationnation.org/take-action/advocacy-center/on-the-hill/chimney-rock.html>

### **May 6 Club Business**

May 6 club business meeting was deferred.

**From Mike Prochoda: Texas Star Party 2010**

We had three fantastic nights in a row during the start of TSP. Thursday night had about 3-4 hours of clear skies (from about 12:30 until 4:00 AM) before the clouds and dew skunked us. Unfortunately, Friday and Saturday nights looked promising early, but clouded up within an hour or two of sunset. A persistent Low weather system hung over TSP during the last 3 days of the star party, but was slated to be cleared-out by a High weather system on Sunday. The Clear Sky Chart for TSP on Sunday night looked fantastic - too bad for us, the star party was over and we had to leave early Sunday AM.

For anyone who has not observed from lower latitudes and truly exceptional dark skies (TSP is at 30 degrees N. latitude and 5000 feet elevation in the Davis mountains) it is an experience not to be missed. Omega Centauri (like M31 and the double cluster) is an object unto itself and does not appear like any globular cluster I have ever seen. Centaurus A, the reflection nebulae of Corona Australis, and the incredible gems in the lower parts of Centaurus, Scorpius and Lupus are sights not to be missed when well above the Southern horizon. The Virgo-Coma galaxies are at the zenith at midnight! I will definitely be back there again in the future.

I will look forward to seeing everyone at RMSS 2010 during the next new moon weekend!

- Mike Prochoda (Estes Park)

From Mike Hotka:

Hello...

I too am having lots of fun here. Second night in a row I stay up till 5AM or later. I have been plowing through galaxies and tonight is looking good also. I need a nappie real bad so I can stay up all night again. I am setup on the south field, way at the west end. My little blue Focus is near my telescope setup. It is storing all my observing gear when we are finished at the end of the night.

Last night was the second night in a row I was visited by a skunk. These critters are so tame that they just walk right up to you and stare. Not polite with all the potent power they are packing. Monday night, I was on the pay phone when one walked by my feet. Not more than 2 feet away. Then last night, someone to my left, in the dark, said there is a skunk here. I heard it and then noticed that he was at my feet, about a foot away, just looking at me. I froze...what else can you do. I guess he was looking for food. He turned around and lumbered off, right UNDER my Focus. All I thought about is if he sprays my wooden telescope base, that odor will be in the wood forever. People might not let me hang our with them anymore at Keota...

Life is fun and interesting...too many galaxies, not enough dark sky time...

Mike H

## From Jim Holder: DAS Site Observing May 16

We had a great May observing night Sunday (last night) at the DAS dark site near Deer Trail. The warming hut was still unsafe to use since the wind had moved it a few feet to the east. Repair work is slated to begin in two weeks. I think we had six observers, which is a pretty good crowd for a Sunday night. If we had skies like this Saturday, I imagine all the pads would have been occupied.

Early in the evening we had nice views of the moon and Venus in the west. Saturn was stunning. It was interesting to make the rounds, looking at Saturn through various telescopes; apertures, magnifications, and optical systems. The needle sharp optics of a fine refractor emphasized the beauty of the shadow of the rings on the body of the planet. A large aperture catadioptric revealed many dim moons lined up just off the nearly edge-on rings. And (IMHO) a good Dobsonian produced the most pleasing combination of visual effects, with the added bonus of getting to keep up by the manual tracking as the planet raced across the field of view. This sense of observing from one of the many moving planets in our solar system really adds something to the experience.

We had quite a few shooters during the night and at least one seemed to break up a little and leave a bright after-image in the sky.

Our sky had been cloudy for so many days and this was probably the last chance before the waxing moon took over the night sky. Conditions were a little humid last night, but the humidity steadied the air without compromising the transparency too much. I was able to push magnification to about 250x on objects like M13 that tolerated power well and some were flirting with 300x on occasion. Mostly we observed in the high 100s. In spite of the humidity, galaxies were outstanding. Dew was a little bit of an issue. Blow drier and dew heaters were in order. Glenn had these cool anti-fog optical cloths made for ski goggles and such. They seemed to work well.

Virgo, Coma Berenices, Leo, Canes Venatici, and Ursa Major galaxies were just outstanding. We observed M106, M8, M82, M 51, NGC 4449, NGC4490, NGC4244, NGC4631 (and friends), M84/M86, M65/66/NGC3628, NGC 4565, NGC 4526, M104 to name a few.

As Centaurs spent time on the meridian, we were able to only just pick out Centaurs A, a strong radio source galaxy that can look like a hamburger under the right kind of sky (NGC5128).

Surprisingly, Omega Centauri, NGC5139 down lower in the south really did look like a globular cluster, not just an amorphous bright blob on the horizon as it usually looks from these latitudes. Near the bright globular cluster, M53 is one of my favorite globs: NGC5053, the one Walter Scott Huston described as something like delicate dancing fairy fire.

It was burning kind of dimly through the humidity in the sky. The fairies were all but sleeping and only just

visible. Maybe we can catch the fairy fire dancing at Star Stare next month if conditions allow. M13, the best of Globulars from this latitude, showed itself in great splendor. At high magnification, the beautiful illusion of whatever optical flaws my telescope and eyepiece produce was doing that faux 3-dimensional thing where I was seeing the central stars of the cluster seeming to be closer to me than the periphery. The "dark propeller" trisecting the globular just off-center was clearly discernable. An absolutely gorgeous sight!

We got an early look at the summer sky as the milky way rose in the east. The Scutum star cloud was extremely bright and there were so many naked-eye stars in the neighborhood of Cygnus and some of us were seeing North American Nebula (NGC7000) pretty clearly without optical aid.

It was a very worthwhile night. We wondered out loud why so few people make the trip to the dark. -Jim H

## From Dave Chamness: Meteorite Hunting and Collecting Magazine

Dear Readers, Meteorite Enthusiasts, Astronomers, Scientists & Educators, I'm proud to invite you to take part in the premier issue of the Meteorite Hunting & Collecting magazine by joining our newsletter list and subscribing to the bi-monthly print magazine which focuses on the adventure and fun of hunting & recovering meteorites in the field, the joy of meteorite collecting, and the science behind it all! Please visit our site for more information about this great new magazine, produced by meteorite people for meteorite people. <http://www.meteoritesusa.com/meteorite-hunting/>  
FULL COLOR ADVENTURE: Inside each full color issue you'll find meteorite hunting and collecting articles, photos, adventure stories, astronomy related articles, and a meteorite dealer marketplace. In addition, you will enjoy fine quality content written by knowledgeable and established members of the meteorite community with years of experience that will share with you the joys and wonder of rocks from space.  
METEORITE WORLD NEWS & INFORMATION: You'll also enjoy updates on meteorite news from around the world featuring the top stories, discoveries, and information within meteorite world.  
NEW TECHNOLOGIES & SCIENTIFIC ADVANCES: This is an exciting time in meteorite history. With that comes advancements in the technologies we use to discover and explore the mysteries of the universe through study, research, meteorite hunting, collecting, and science.  
IN THE KNOW: With your yearly subscription of Meteorite Hunting & Collecting magazine, you'll have an inside look at all the latest technological and scientific advances that are happening within the meteorite community and main stream science. Astronomy articles related to meteorites and lots more. Your annual subscription entitles you to 6 full color issues of Meteorite Hunting & Collecting magazine chock full of meteorite information, adventure and science.  
Regards, Eric Wichman, Meteorites USA  
[www.meteoritesusa.com](http://www.meteoritesusa.com)

## From Andrea Schweitzer: A Virtual Walk on the Moon

More than 37 years after humans last walked on the Moon, planetary scientists are inviting members of the public to return to the lunar surface as “virtual astronauts” to help answer important scientific questions. No spacesuit or rocket ship is required -- all visitors need to do is go to [www.moonzoo.org](http://www.moonzoo.org) and be among the first to see the lunar surface in unprecedented detail. New high-resolution images, taken by NASA’s Lunar Reconnaissance Orbiter Camera (LROC), offer exciting clues to unveil or reveal the history of the Moon and our solar system.

The Moon Zoo Web site is a citizen science project developed by the Citizen Science Alliance, a group of research organizations and museums, and builds on the team’s success with Galaxy Zoo, which has involved more than 250,000 people in astronomical research.

“We need Web users around the world to help us interpret these stunning new images of the lunar surface,” said Chris Lintott of Oxford University and chair of the Citizen Science Alliance. “If you only spend five minutes on the site counting craters you’ll be making a valuable contribution to science and, who knows, you might run across a Russian spacecraft.”

Scientists are particularly interested in knowing how many craters appear in a particular region of the Moon in order to determine the age and depth of the lunar surface (regolith). Fresh craters left by recent impacts provide clues about the potential risks from meteor strikes on the Moon and on Earth.

“We hope to address key questions about the impact bombardment history of the Moon and discover sites of geological interest that have never been seen before,” said Katherine Joy of the Lunar and Planetary Institute and a Moon Zoo science team member.

NASA Lunar Science Institute (NLSI) scientists are contributing to the Moon Zoo efforts by providing science expertise. NLSI is also providing educational content and supporting outreach goals of the project.

“The NASA Lunar Science Institute is very excited to be involved with Moon Zoo and support lunar citizen science,” said David Morrison, NLSI director. “Science and public outreach are cornerstones of our Institute; Moon Zoo will contribute to the accomplishment of important science, while being a major step forward in participatory exploration.”

“The Lunar Reconnaissance Orbiter Project Science Office is excited to see LRO data being used for citizen science projects,” said Rich Vondrak, LRO project scientist from NASA’s Goddard Space Flight Center, Greenbelt, Md. The Moon Zoo project provides an opportunity for everyone to

participate in analysis of images from the LRO Camera and to make a significant contribution to scientific knowledge about the Moon.”

The Lunar Reconnaissance Orbiter mission is managed by Goddard Space Flight Center, Greenbelt, Md. and the LROC instruments are based out of Arizona State University in Tempe, Az. The NASA Lunar Science Institute is based out of NASA’s Ames Research Center, Moffett Field, Calif.

For more information about Moon Zoo, visit:  
<http://www.moonzoo.org>

For more information about the Citizen Science Alliance,  
<http://www.citizensciencealliance.org/>

For more information about the NASA Lunar Science Institute, visit:  
<http://www.lunarscience.nasa.gov>

For more information about LRO and LROC, visit:  
<http://www.nasa.gov/lro> and <http://www.lroc.sese.asu.edu/>

## Heads up, binocular target Comet McNaught C/2009 R1 brightest in June 2010. May 2010 chart link:

[http://cometchasing.skyhound.com/comets/2009\\_R1.gif](http://cometchasing.skyhound.com/comets/2009_R1.gif)

Heavens-Above chart:

<http://www.heavens-above.com/comet.aspx?cid=C%2F2009%20R1&lat=54.326&lng=-2.746&loc=Kendal&alt=72&tz=GMT>

## Best Looks

Moon	By Jupiter June 6; by Venus June 15 By Mars June 17; by Saturn June 19 Partial Lunar Eclipse June 26
Mercury	Hidden by glare
Venus	W at twilight
Mars	High in W at sunset
Jupiter	In E predawn
Saturn	In S in evening
Uranus	Near Jupiter

ISS Marathon season is here, note multiple illuminated passes.

Date	Mag	Starts			Max. <u>altitude</u>			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
<a href="#">4 Jun</a>	-0.4	05:20:38	10	SSE	05:21:37	11	SE	05:22:36	10	ESE
<a href="#">6 Jun</a>	-0.5	04:32:25	10	SSE	04:33:24	11	SE	04:34:23	10	ESE
<a href="#">7 Jun</a>	-2.3	04:53:50	10	SSW	04:56:28	37	SE	04:59:08	10	ENE
<a href="#">8 Jun</a>	-0.7	03:44:22	11	SE	03:44:57	11	SE	03:45:55	10	ESE
<a href="#">9 Jun</a>	-2.4	04:06:40	23	S	04:07:55	36	SE	04:10:35	10	ENE
<a href="#">10 Jun</a>	-3.1	04:28:51	15	WSW	04:31:03	59	NW	04:33:52	10	NE
<a href="#">11 Jun</a>	-2.2	03:19:32	34	ESE	03:19:32	34	ESE	03:21:48	10	ENE
<a href="#">11 Jun</a>	-1.4	04:51:58	10	W	04:54:20	23	NNW	04:56:42	10	NNE
<a href="#">12 Jun</a>	-3.1	03:41:29	43	W	03:42:09	60	NW	03:44:59	10	NE
<a href="#">13 Jun</a>	-0.7	02:31:59	17	ENE	02:31:59	17	ENE	02:32:48	10	ENE
<a href="#">13 Jun</a>	-1.4	04:03:20	12	WNW	04:05:19	23	NNW	04:07:43	10	NNE
<a href="#">14 Jun</a>	-2.2	02:53:43	43	NNE	02:53:43	43	NNE	02:55:52	10	NE
<a href="#">14 Jun</a>	-0.5	04:27:05	10	NW	04:28:37	13	NNW	04:30:09	10	NNE
<a href="#">15 Jun</a>	-1.3	03:15:22	21	NW	03:16:05	24	NNW	03:18:29	10	NNE
<a href="#">16 Jun</a>	-0.6	02:05:34	19	NE	02:05:34	19	NE	02:06:32	10	NE
<a href="#">16 Jun</a>	-0.4	03:37:43	10	NW	03:39:16	14	NNW	03:40:49	10	NNE
<a href="#">17 Jun</a>	-1.1	02:27:01	23	NNW	02:27:01	23	NNW	02:29:03	10	NNE
<a href="#">18 Jun</a>	-0.3	02:48:21	11	NW	02:49:41	14	NNW	02:51:16	10	NNE
<a href="#">19 Jun</a>	-0.4	01:38:15	18	NNE	01:38:15	18	NNE	01:39:23	10	NNE
<a href="#">19 Jun</a>	0.2	04:47:43	10	NNW	04:48:56	12	NNE	04:50:07	10	NE
<a href="#">20 Jun</a>	-0.2	01:59:20	13	NNW	01:59:54	14	NNW	02:01:30	10	NNE
<a href="#">21 Jun</a>	-0.2	00:48:56	14	NNE	00:48:56	14	NNE	00:49:31	10	NNE
<a href="#">21 Jun</a>	0.3	02:22:42	10	NNW	02:22:54	10	N	02:23:06	10	N
<a href="#">21 Jun</a>	0.3	03:57:50	10	N	03:59:00	12	NNE	04:00:09	10	NE
<a href="#">22 Jun</a>	-0.1	01:09:33	14	NNW	01:09:52	14	NNW	01:11:32	10	NNE
<a href="#">22 Jun</a>	-0.3	04:19:44	10	NNW	04:21:53	19	NNE	04:24:01	10	ENE
<a href="#">22 Jun</a>	-0.6	23:58:16	18	NNE	23:58:16	18	NNE	23:59:25	10	NNE
<a href="#">23 Jun</a>	0.4	01:32:26	10	NNW	01:32:46	10	N	01:33:06	10	N
<a href="#">23 Jun</a>	0.4	03:07:44	10	N	03:08:52	12	NNE	03:09:59	10	NE
<a href="#">23 Jun</a>	-1.9	04:41:49	10	NW	04:44:32	40	NNE	04:47:14	10	ESE

<a href="#">23 Jun</a>	-3.3	22:41:20	10	WSW	22:44:09	76	NW	22:47:00	10	NE
<a href="#">24 Jun</a>	0.0	00:17:57	10	NW	00:19:38	14	NNW	00:21:19	10	NNE
<a href="#">24 Jun</a>	-0.3	03:29:32	10	NNW	03:31:38	18	NNE	03:33:43	10	ENE
<a href="#">24 Jun</a>	-3.4	05:04:07	10	WNW	05:06:55	59	SW	05:09:42	10	SE
<a href="#">24 Jun</a>	-2.5	21:29:03	10	SSW	21:31:33	28	SE	21:34:03	10	ENE
<a href="#">24 Jun</a>	-1.1	23:04:06	10	W	23:06:36	27	NNW	23:09:06	10	NE
<a href="#">25 Jun</a>	0.5	00:42:01	10	NNW	00:42:24	10	N	00:42:47	10	N
<a href="#">25 Jun</a>	0.4	02:17:27	10	N	02:18:29	11	NNE	02:19:32	10	NE
<a href="#">25 Jun</a>	-1.8	03:51:27	10	NW	03:54:10	39	NNE	03:56:51	10	ESE
<a href="#">25 Jun</a>	-3.3	21:50:53	10	SW	21:53:43	80	NW	21:56:34	10	NE
<a href="#">25 Jun</a>	0.0	23:27:25	10	NW	23:29:10	15	NNW	23:30:54	10	NNE
<a href="#">26 Jun</a>	-0.3	02:39:05	10	NNW	02:41:09	18	NNE	02:43:12	10	ENE
<a href="#">26 Jun</a>	-3.5	04:13:38	10	WNW	04:16:27	63	SW	04:19:15	10	SE
<a href="#">26 Jun</a>	-1.1	22:13:30	10	W	22:16:00	28	NNW	22:18:33	10	NE
<a href="#">26 Jun</a>	0.5	23:51:17	10	NNW	23:51:49	10	N	23:52:19	10	N
<a href="#">27 Jun</a>	0.4	01:26:53	10	N	01:27:54	11	NNE	01:28:53	10	NNE
<a href="#">27 Jun</a>	-1.8	03:00:54	10	NW	03:03:35	37	NNE	03:06:15	10	E
<a href="#">27 Jun</a>	-1.9	04:36:23	10	W	04:38:28	18	SW	04:40:31	10	S
<a href="#">27 Jun</a>	-3.3	21:00:13	10	SW	21:03:03	85	NW	21:05:54	10	NE
<a href="#">27 Jun</a>	0.0	22:36:41	10	WNW	22:38:28	15	NNW	22:40:15	10	NNE
<a href="#">28 Jun</a>	-0.3	01:48:25	10	NNW	01:50:27	17	NNE	01:51:03	16	NE
<a href="#">28 Jun</a>	-1.1	21:22:41	10	W	21:25:15	29	NNW	21:27:48	10	NE
<a href="#">28 Jun</a>	0.5	23:00:22	10	NNW	23:01:00	10	N	23:01:38	10	N
<a href="#">29 Jun</a>	0.3	00:36:09	10	N	00:37:05	11	N	00:38:01	10	NNE
<a href="#">29 Jun</a>	0.0	21:45:44	10	WNW	21:47:34	16	NNW	21:49:24	10	NNE
<a href="#">30 Jun</a>	-0.1	00:57:33	10	NNW	00:58:48	16	N	00:58:48	16	N
<a href="#">30 Jun</a>	0.4	22:09:17	10	NNW	22:09:58	11	N	22:10:40	10	N
<a href="#">30 Jun</a>	0.2	23:45:12	10	N	23:46:03	11	N	23:46:53	10	NNE

ISS predictions from:

<http://www.heavens-above.com/main.aspx?lat=40.4997&lng=-105.05736&loc=Fort+Collins+CO+USA&alt=0&tz=MST>