

## Kitt Peak Pictures

### President's Message

*Editor's Note: Matt has been out of town on business. The evening program tonight will be on Kitt Peak by John Blackwell.*

\* Matthew Marulla  
NHAS President 2005

### Public Observing Highlights

Between summer and the weather, there has not been much public observing. We do have some upcoming sky watches at Goffstown, Chichester, and Hillsborough. Further announcements will be sent via the email and the website event calendar.

\* Ed Ting

### Astrophoto of the Month

Herb Bubert took this one on July 4<sup>th</sup> during some intense sunspot activity.



Photo by Herb Bubert

### Kitt Peak Pictures

*Editor's Note: Our very own John Blackwell recently spent time at Kitt Peak National Observatory, Tucson, AZ and took some wonderful pictures using equipment at that location. John has posted several of them on his Regulus website for us to enjoy. I am including a few of them here along with John's email description recently sent out.*

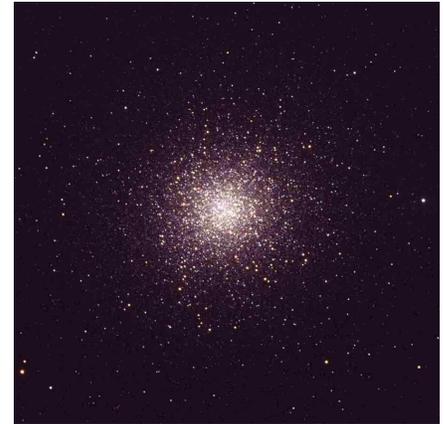
*John will be presenting at this Friday's meeting about his time at Kitt Peak..*

Here are some lovely images, which our group took while at Kitt Peak. Though not strictly scientific in nature, they sure do prove the old astronomer's adage that larger diameter wins every time. These were taken using the Kitt Peak 0.9m telescope which is mounted on a really neat Boller and Chivens equatorial mount. The assembly was made in July of 1965 (the month and year I was born) and is painted in blue, the surplus Navy paint that has covered so many telescopes of that era. The CCD imager is a Kitt Peak Model CCD camera with liquid nitrogen cooling. No darks are needed. Sky flats and standard bias frames were used. Filters were H-Alpha, V and B photometric. The Eagle Nebula



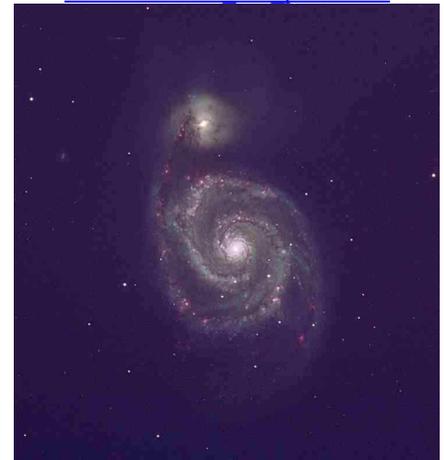
Photo provided by John Blackwell

[http://www.regulusastro.com/regulus/photos/text/eagle\\_kitt\\_peak.html](http://www.regulusastro.com/regulus/photos/text/eagle_kitt_peak.html)



M-13 Hercules Cluster provided by John Blackwell

[http://www.regulusastro.com/regulus/photos/text/m13\\_kitt\\_peak.html](http://www.regulusastro.com/regulus/photos/text/m13_kitt_peak.html)



M-52 the Whirlpool Galaxy provided by John Blackwell

[http://www.regulusastro.com/regulus/photos/text/m51\\_kitt\\_peak.html](http://www.regulusastro.com/regulus/photos/text/m51_kitt_peak.html)

\* Rich DeMidio

### Noteworthy News

Matt's Presentation Part 2 ... Page 2

## Polars, Magnetars, and Blazars

*Editor's Note: This is the 2<sup>nd</sup> article in the series from the astrophysics workshop that Matt attended. NASA sponsored his attending in return for sharing the lessons learned with our membership.* A **Polar** is defined as a short period binary star about the size of an average white dwarf. The companion star is of very low mass with an orbital duration ranging from eighty minutes to 8 hours. They represent a very small system on the order of only 1/10 of 1% of the size of our own sun. Scientists classify them as variable star designations. These are relatively new objects so only eighty or so are documented to date, but scientists suspect there are many more to be discovered. Some Polars have been observed where their magnitude has changed two levels within thirty minutes. Scientists are not sure on what exactly is happening with Polars, but some speculate that they could be either an eclipsing binary, that it could be synchrotron radiation, an accretion disc, a hot spot, or a material stream of matter between components. There is some thought that an observed hot spot really represents impacting material onto the crust of the Polar. Taken together, they result in random light fluctuations, which we observe back on Earth. The trick of course, is to figure what exactly is causing the fluctuations.



Photo by Chase McNiss

**Magnetars** are objects that are powered magnetically. So, they are a neutron star but what makes them different is

that they are very short lived and their rate of rotation slows down over time compared to a neutron star which is constant. So, in terms of object oriented technology, a magnetar is a subclass of a neutron star base class ☺ A magnetar can rotate between five and eleven seconds. Hence, they are short lived and slow down quickly. As implied by its name, a magnetar has a much stronger magnetic field. Out of all the known neutron stars to date, only eleven of them are now designated a Magnetar. They do burst occasionally with emissions caught in optical, xray, and radio spectrums. It is thought that the bursts are caused by the magnetic field breaking the crust of the neutron star. Unlike a Neutron star, which is very dense and contains only neutrons, a Magnetar is believed to have a thin crust only five to six inches thick. This crust is believed to be normal matter. On a Magnetar the strong magnetic field has the ability to influence the crust causing it to fracture thus the catastrophic burst release. The core is fractured matter and the atomic structure becomes ripped apart leaving only leaving a mass of neutrons. In fact, most of the matter is empty space between the neutron and electron. To get a better feeling for this, if the core were a grain of salt, the electron would be 100 yards away. So, most matter is not dense but in a Neutron star and Magnetar, the matter is very dense.

**Blazars** In some galaxies, known as "active galactic nuclei" (AGN), the nucleus (or central core) produces more radiation than the entire rest of the galaxy! Quasars are very distant AGN - the most distant quasars mark an epoch when the universe was less than a billion years old and a sixth of its current size. In some cases, the size of the AGN is smaller than the size of our solar system. <sup>1</sup> A **Blazar** is a type of AGN that emits energy everywhere on every wavelength. It is visible with telescopes that detect the various wavelengths. It is a bright source of every spectrum. They are also variable on all time scales. i.e. ½ magnitude in thirty minutes to years. They were originally designated as a variable stars

but as technology has improved, their characteristics discovered warrant their own special designation. Upon closer examination, scientists discovered that there appeared to be a relationship between blazars and seyfert galaxies, Radio emissions, quasars, or optically violent variables. As a result, some folks started to work on a theory that puts this all together. In short, the theory states that how you see the blazar totally depends upon your perspective based on your location. Some can be seen as a Taurus or accretion disk. Sometimes, an object is pointing right at us so we would be looking right down the Blazar. A barrier to studying these in more detail is lack of observatories. As a result, a lot of work has come from amateurs who done studies and observations. The website [www.aavso.org](http://www.aavso.org) is the starting point for those who wish to study and contribute.

\* Article written by Rich DeMidio using Matthew Marulla's presentation

## Deep Sky Object of the Month

Observer: Lew Gramer  
 Your skills: Intermediate  
 Date and UT of Observation: 1996-06-12, 05:30 UT  
 Location: Sheepsfold, MA, USA (42N)  
 Site classification: suburban  
 Limiting magnitude: 5.7  
 Seeing: 4 - med poor  
 Moon up: no  
 Instrument: 35mm binos hand-held  
 Magnification: 7x  
 Filters used: none  
 Object: M57 (Ring Nebula)  
 Category: planetary nebula  
 Constellation: Lyr  
 Data: mag 9.0; 86"x62"  
 RA/DE: 18h53 +33o02  
 Description: Confirmed the position of the Ring relative to Bet and Gam Lyr in the 7x35 bino field. Appearance was obviously non-stellar, but no other features apparent.

--  
 It's often sort of thrilling to find "deep-sky" objects with a simple binocular sweep! No detail at all was seen in M57, but it WAS exciting to confirm that my binos will

<sup>1</sup> Definition of AGN taken from <http://heasarc.gsfc.nasa.gov/docs/object/agn/agn.txt.html>

go down to 9th mag. with a suburban sky and patience. :)

\* Lew Gramer

## Other News

**Barbara O'Connell** reported about the US to spin out a giant mirror in July 2005. Progress continues on the Giant Magellan Telescope with the rotary casting of an 8.4 m mirror. Read the full story at

<http://optics.org/articles/news/11/7/3?alert=1> **John Bishop** added the following as also nice reference point.

<http://www.as.arizona.edu:8080/Astro/1102981959/index.html> and <http://www.gmto.org/>

**Deep Impact** NASA's recent project to purposely crash a probe into a comet was very successful. The full NASA story may be viewed at:

<http://deepimpact.jpl.nasa.gov/press/050708jpl.html>

**Mars Approach** With some recent hype about Mars coming close to earth again this fall, I decided to look up a few articles. The following link explains some of NASA's plans for future missions some of which need to be learned during the approach.

<http://marsprogram.jpl.nasa.gov/misissions/future/2005-plus.html> I also found a good article from NASA [http://science.nasa.gov/headlines/y2005/27may\\_approachingmars.htm](http://science.nasa.gov/headlines/y2005/27may_approachingmars.htm)

## On the Lighter Side

**A Rare Celestial Event** on July 2<sup>nd</sup>, **Larry Lopez** reported ... According to the clear sky clock we will be treated to a very rare celestial event tonight. It's very technical but the gist of it seems to be that electromagnetic energy in the visible spectrum should be able to pass through the earth's atmosphere relatively unattenuated. You should avail yourself of this once in a lifetime opportunity. On July 3<sup>rd</sup>, **Paul Winalski** reported ... As Larry pointed out; the evening of Saturday 2 July was a rare celestial event for New England, in that we had clear skies. YFOS was positively crowded with observers crazed by cabin fever and eager to look at everything and anything under clear skies. But there were some genuinely rare or unusual celestial events that we saw. Mercury started off the evening at twilight. Normally it would not be visible at this low a point in a

somewhat unfavorable elongation, but it is within a few degrees of Venus, which at mag -4 can be detected while still well above the horizon. Venus and Mercury are in the same field for binoculars and at low power (15x) in a TV85. Although the skies were dark and clear, seeing wasn't particularly good, especially near the horizon. Jupiter's moons were doing their usual dance, but I couldn't get much detail on the planet itself. Porrima was too blobby to see whether there was any separation. This was not a night for close doubles. The International Space Station crossed the sky--twice! The first crossing was very bright--magnitude 0--and pretty high in the sky. I was able to track it with a 9x50 spotter and caught the occasional glimpse in the 14" scope. The second crossing was at magnitude 2 and lower in the sky. Once the skies got dark, we hunted down comet Temple 1/9P. It was right where CalSKY said it would be--a simple star hop from Spica. It is a very dim and totally underwhelming object, but this was maybe the last chance to observe it in its unaltered, pre-Deep Impact state. M51 was magnificent, especially in the three 16" scopes. Supernova SN23005CS (speaking of rare celestial events) was clearly visible--the star that shouldn't be there in the first spiral arm on the opposite side from the companion galaxy. It looked to be somewhere around 13th magnitude.

That works out to an absolute magnitude of around -20. That's something like 6 billion times brighter than the Sun! Heavens Above had predicted a magnitude -4 Iridium flare at about 11:30, but it didn't happen. Instead we got a flare that was at least magnitude -6. Spectacular! I was finally able to track down Krueger 60, a very dim double star (two red dwarfs, one a flare star) near delta Cephei that proved very hard to find because of all the clutter in that area. I also said hello to S Cephei and T Lyrae (it's not a true observing evening without a carbon star or two). Everyone was having fun getting reacquainted with the DSOs of the Sagittarius Milky Way and other

summertime friends. There were great views of the Veil using OIII filters. The mosquito magnet is collecting them by the thousands, but it has a long way to go before it can clear out the resident population, who were out in force at twilight. They'd ceased to be a problem by about 10 PM. The dew was drenching us all as the evening progressed. Lots of sounds of hair dryers. After taking a break at midnight, I returned to find out that the Rigel QuikFinder, spotting scope, secondary, and eyepiece were all dewed over--the anti-dew heaters had been overwhelmed. I got in another hour or so of observing before everything dewed over again and I called it quits. So: Mercury, two ISS transits, a very bright Iridium flare, a newly discovered supernova, and the last view of Tempel 1 before impact. That's a rare celestial event-filled evening in my book. Clear skies

\* Rich DeMidio

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**A/P:** \$1231.91 (Insurance)

**Net Balance:** \$2,872.83

**Cash Balance:** \$2,872.83

**Membership:** 116

**New members:** None

**Donations:** None

\* Barbara O'Connell

## Looking Back at Last Month

**Opening.** **Matt Marulla** walked us through the various department reports and set the stage for the evening program on Polars, Magnetars, and Blazars. **Scope of the Month.** None.

**Public Observing.** **Ed Ting** was not present so **Matt Marulla** reported about a few schools that have requested some skywatches. Ed is aware of these requests and will look into them. **Book of the Month, Matt Marulla** Amateur Telescope Making (ATM), the 1954 edition. Matt also has a 1<sup>st</sup> edition that was published in 1926. Matt invited folks to look at them during the break.

**Committees.** Photo Club There was some confusion on when the last meeting occurred so only a few folks showed up. **Herb Bubert** reported that a few folks talked about focusing tips.

Web: **Matthew Marulla** reported that the new web site is online, but is work in progress. The newsletter will be published in the new location moving forward. **Rich DeMidio** reported that previous newsletters will gradually be moved over the next few months. The members only area currently only has YFOS directions. The officer's only area has been established. ATMs:

**Larry Lopez** reported that Joe Derek is hosting an event on Sunday to help get a scope ready for Stellafane. Larry and Don are helping with electronics for slewing. This is a large project that Joe has been working on. Oh, Matt did mention that he is a Stellafane judge ☺

Membership: **Bob Sletten** reported about the recent Astro Lab sessions at YFOS. They were successful noting that the Mosquitoes enjoyed them. Bob has asked the membership for feedback regarding topics for the next sessions. Please provide your ideas to Bob directly or at upcoming club meetings.



Photo by Chase McNiss

YFOS. **Larry Lopez** reported that the lawn was mowed last week. Larry brought his tractor and **Chase McNiss** trimmed. The mosquito magnet was moved to a better position. Bad weather has contributed to not checking it enough. As we are able to get there more, we can find the optimal location. Joel Harris volunteered to provide a new push mower for the site, as the current one is sad shape. Other Topics. **Matt Marulla** reported that Opportunity is unstuck! However, the geology science team wants the engineering team to now turn around and go back to understand why it got stuck in the first place! **Bob Sletten** reported that there is sufficient interest in Radio Astronomy from his ham radio club. Since there has some interest Bob is willing to start and head up a committee if sufficient interest exists. Anyone interested is should contact Bob. *Editor's Note: If this committee does get created, it will get press each month in the Newsletter.* Evening Program Polars, Blazars, and Magnetars (feature article above)

\* Rich DeMidio

## NASA Space Place

*Editor's Note: I am including the text sent me via email for this month's article. "Where on Earth...?" Mystery Image Quiz* Many of our partners enjoy the challenge of the "Where on Earth...?" Mystery Image Quizes featured on the MISR project web page. Quiz participants have to follow clues to determine the location of the

featured image. The newest quiz has just come out. You can find it at

<http://www-misr.jpl.nasa.gov/>

Also try the Emoticonstructor. Let it "evolve" a face to match your mood, just like computers evolved a new spacecraft antenna design using artificial evolution.

<http://spaceplace.nasa.gov/en/kids/st5/emoticon/>

\* Rich DeMidio

**DEADLINE August 2005 Issue: 5 PM Aug 15**

E-mail articles to the Editor.

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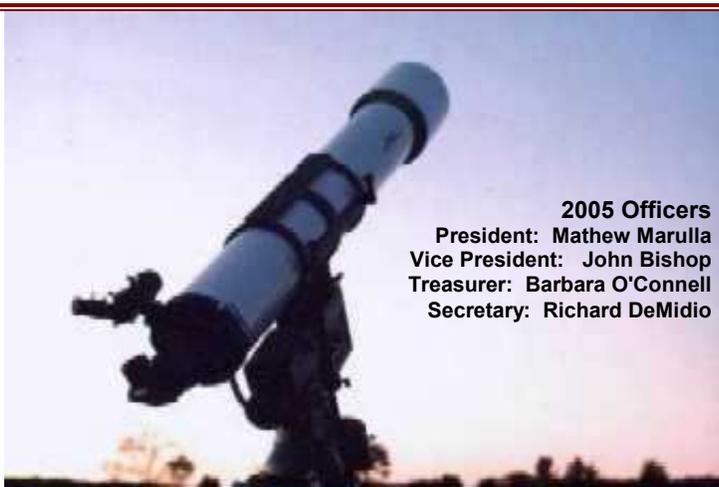
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**This month's contributors:**

Mathew Marulla, John Blackwell, Ed Ting, Herb Bubert, Chase McNiss, Larry Lopez, Barbara O'Connell, Rich DeMidio, Bob Sletten, Lew Gramer, Paul Winalski

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**Kitt Peak, 7/15 St. Anslem's**

**NHAS Upcoming Events**

<b>Event</b>	<b>Date</b>	<b>Time</b>	<b>Location</b>
July Business Meeting	July 15	7:30 pm	St. Anslem's
CMP Skywatch	Aug 5	7:30 pm	Planetarium Concord, NH
Coffeehouse	Aug 5		YFOS
August Business Meeting	Aug 19	7:30 pm	Planetarium Concord, NH
CMP Skywatch	Sep 2	7:30 pm	Planetarium Concord, NH
Coffeehouse	Sep 2		YFOS
Sept Business Meeting	Sep 16	7:30 pm	St. Anslems