NIGHTFALL
Huachuca Astronomy Club of Southeastern Arizona

General Meeting is 28 May 2010

May 2010

7 pm, Cochise College, Sierra Vista, Rm. 305A/B

Guest Speaker: Wayne Johnson (aka Mr. Galaxy)
Topic: Mr. Galaxy's Six Supernova Discoveries

PLUS our monthly Show-N-Tells, upcoming event details, refreshments & Door Prizes!

The President's Perspective

by Wayne (aka Mr. Galaxy) Johnson, HAC President

First, we must thank Dave Healy for hosting our May Astronomy Night (Star Party). Those of us in attendance had a great time. Despite all the strange Spring weather we've been having, the weather cooperated that night and HAC members who attended had a pleasant evening in Dave's observatory where he pointed his 32-inch telescope to a nice variety of visitor-requested objects. A couple other members brought along their scopes to keep the lines behind the telescopes short. Although we didn't get a large number of students from Kim Rogalski's Cochise College astronomy class, which usually helps bolster attendance, the ones who were there were enthusiastic and took good notes. Dave has been most generous with allowing us to use his observatory facilities and has stated that he would like to go back to having monthly Astronomy Nights at his place. If and when other members decide they want to host the HAC membership at their place we will just have another star party during that month. This arrangement will make it easier on our Vice-President and Star Party chairman, Glen Sanner, for setting up monthly observing events.

As many of you know, Glen, Bob Kepple, and Bob Gent went to the Texas Star Party (TSP) near Fort Davis, Texas, in mid-May. We hope to hear how their adventures went at our upcoming May meeting. Bob K and Glen have been going to the TSP for over 20 years and I heard that the weather was great, but that attendance was down. Unfortunately, the other big Astronomy Conference in our part of the country (though in the opposite direction), the Riverside Telescope Makers Conference (RTMC) in Big Bear, California, was held the same weekend as TSP making for a difficult decision as to which event to attend. I enjoy both and have participated in each for many years. In fact, Arlene and I were married at the RTMC 16 years ago this coming Memorial Day. I highly encourage anyone and everyone to attend either one or both of these events. You won't regret it.

Local area weather has been weird lately! A few Sundays ago, my wife and I were were "lucky enough" to be in Tucson just in time to experience a dust storm with high winds (which pitted my windshield) and almost zero visibility for about 10 minutes, accompanied by rain and hail, while we were driving around town after visiting Sabino Canyon. Arlene reported 1/2-inch hailstones in a separate storm about an hour later while running another errand. Springtime in the southwest seems to be synonymous with wind so that the seeds from all our weeds can be spread around! We don't

necessarily get the brunt of the storms, but we get the windy conditions on the outskirts of those weather systems.

I hope everyone has been getting a chance to go out and observe, even if it is from the backyard. Despite the prevailing windy weather conditions the seeing and transparency have in general been good and I have enjoyed especially nice views of galaxies (my main area of interest) through my 25-inch telescope. Though it has been fairly breezy and my scope acts like a big sail I have had great views of many of the evasive smaller galaxies in the Virgo Cluster and had a nice view of the Coma Cluster, too. I made good observations of some of the showpiece galaxies like M104 (the Sombrero), M51 (the Whirlpool) and M101 and saw quite a number of smaller galaxies in their surrounding areas. I am noticing at the end of my observing sessions (about 1am during the week) that the Milky Way is beginning to encroach on my views of the external galaxies and will eventually obscure most of them. For this reason I call the Milky Way, the "Great Curtain in the Sky", since it blocks out everything behind it. I can't complain too much, though, I've had a good amount of galaxy observing for the winter and spring.

We continue to have our Sidewalk Astronomy viewing sessions around town as time and weather conditions allow and we have been very successful at it! Glenn Minuth has done a great job arranging times and locations for our events with local vendors (especially thanks to Ace Hardware, Walmart and the Mall at SV). Glenn has purchased several posters and traffic control cones so that our viewing area can be cordoned off and attention drawn to our activity. So far Rich Swanson, Scott Schneeweis and Eric Sundius have graciously spent time setting up their telescopes so that shoppers and others running errands can take a quick glance at celestial objects and perhaps gain an appreciation for another aspect of life outside their work-a-day world. Our May session (last night as I write this) featured the Moon, and the planets Venus, Mars and Saturn, along with a special guest appearance by the International Space Station (ISS). We try to concentrate our attention on the first quarter Moon or some other bright celestial object so that people (most of whom have never seen through a telescope) can enjoy the view. Please come and join us. It's simple and it's fun!

Travels on the Celestial Sphere - June

Needles of stars

By Glen Sanner & Bob Kepple

NGC 4244 is a very large, magnificent edge-on galaxy with a mottled envelope.

We continue our galaxy quest this month by highlighting some very nice edge -on galaxies that appear as thin needles, all of them br ight and easily found in small telescopes. These galaxies are angled nearly edge-on from our line of sight and therefore appear brighter than face-on galaxies. The light from galaxies is the combined glow from hundreds of billions of stars not resolvable d ue to their immense distance from us. In Arizona we have about one more month before the clouds of the Monsoon season start to interfere telescopic viewing so take advantage any clear nights before late June or July.

NGC 3556, M108, Type SBcd III_IV, Dia. 8.1'x2.1', Mag. 10.0v, SB 13.0, $11^h11.5^m$ +55°40', UMa

Messier 108 was discovered by Mechain in either 1781 or 1782. In small telescopes M108 is a faint but conspicuous 7.0'x1.5' E -W streak with a brighter center having vague dark and light streaks. In 8-inch scopes it shows a bright, mottled envelope with dark areas along its entire length the most conspicuous just west of the galaxy's center. A 12 th magnitude star lies just south of the halo's western tip.

NGC 4206, Type SAbc:, Dia. 5.3'x0.9', Mag. 12.2v, SB 13.7, $12^h15.3^m$ +13°02', Vir
NGC 4216, Type SABb: II, Dia. 7.8'x1.6', Mag. 10.0v, SB 12.6, $12^h15.9^m$ +13°09', Vir
In small telescopes **NGC 4216** is visible as a bright 5'x0.5' NNE-SSW streak containing a bright, highly extended core. In medium-size telescopes NGC 4216 is a spectacular sight with a thin spindle elongated 6'x1' NNE-SSW. Its core is very bright and extended about 2' long with a stellar nucleus at center. A dark lane is silhouetted along the glow of the core's eastern side. The halo seems extended further east than the west side. **NGC 4206**, lying 11' SW of NGC 4216, is a faint but moderately concentrated streak elongated 4'x0.5' N-S with an irregularly brighter center. **NGC 4222**, a third edge-on galaxy lies 12' NE of NGC 4216 just across the Virgo border in Coma Berenices.

NGC 4244, Type SAcd IV, Dia. 17.0'x2.2', Mag. 10.4v, SB 14.2, $12^h17.5^m$ +37°49', CVn
Magnificent! We consider NGC 4244 to be the rival of the well-known edge-on galaxy NGC 4565. It is a long shaft of light with a mottled texture throughout. An 8-inch scope will show a 15'x1.2' NE-SW spindle with a slightly brighter, extended core. Faint, irregular knots are visible near each tip of its slightly bulged core. The extensions fade from center until they simply disappear. Its SW tip touches an 11th magnitude star and its NE tip extends slightly past a 12th magnitude star.

NGC 4565, Type SAb sp I, Dia. 14.0'x1.8', Mag. 9.6v, SB 12.9, $12^h36.3^m$ +25°59', Com
NGC 4565 is one of the brightest members of the Coma I Galaxy Cloud which lies some 31 million light years away. Considered by many observers to be the "showpiece" of all edge-on galaxies' NGC 4565 is a beautiful streak elongated 14'x1.5' in medium size telescopes. Its dust lane along the NE flank is visible in small telescopes with averted visible and quite obvious in larger instruments. The galaxy shows a bulging core at center resembling the typical version of a flying saucer. In large scopes at medium power this streak of distant stars will nearly fill the entire field of view.

NGC 4631, Type SBd III, Dia. 15.5'x3.3', Mag. 9.2v, SB 13.3, $12^h42.1^m$ +32°32', CVn
NGC 4631 is an awesome sight in any size telescope. It has a tiny companion off its northern flank. This pair is often called "The W hale and the Pup." An 8-inch telescope will show a bright glowing streak highly elongated 14'x1.5' E-W with tapered ends and a mottled texture throughout. Its central bulge is offset to the east and is more protruded on the northern side. Larger scopes will show a well concentrated knot on its western tip and numerous bright and dark splotches along the length of its major axis. A low power view will show the "Hockey Stick" (NGC 4656-57) in the same field of view about a degree to the SSE.

NGC 5746, Type S A?b sp, Dia. 6.8'x1.0', Mag. 10.3v, SB 12.3, $14^h44.9^m$ +01°57', Vir
In small telescopes NGC 4517 is a large, soft glow elongated 6'x1' E-W with tapered tips. A 10th magnitude star nearly touching its center lies along its northern flank and an 11th magnitude star is visible north of the galaxy's eastern tip. 12-inch and larger scopes will reveal an 8'x1.7' ENE-WSW envelope with a patchy center and some knots strung along its northern wing. With averted vision a thin dark dust lane may be glimpsed along the eastern flank.

CLASSIFIED ADS

ALCON 2010

The Astronomical League, Tucson Amateur Astronomy Association, and International Dark Sky Association are hosting ALCON 2010 in Tucson, June
24th – 26th. In addition, Lunt Solar Systems will hold their annual Arizona Solar Conference, and IDA will hold their Annual General Meeting at the same venue.
This will likely be the largest amateur astronomy event in Arizona for many years – you don't want to miss it! ALCON has everything you can ask for:

- Outstanding speaker lineup;
- Plenty of well-known vendors showing and selling their products;
- Editors from the major astronomy magazines in attendance;
- Opportunities for star parties, banquets, and social fellowship;
- Solar observing through various specialized telescopes;
- Inexpensive registration fees;
- Free youth admission;
- Discounted college student admission;
- Very cool T-shirts and other swag;
- Some very nice door prizes including telescopes;
- Silent auction for astronomy equipment and accessories;
- and much, much more!

All this right here in Arizona.

We will be accepting registrations right up until the convention, but I encourage everyone to sign up asap. There will be a price increase after June 1st, so you should take care of it before then. Note that the convention hotel is already sold out (this is going to be a big convention!) – if you need hotel rooms, contact us for nearby alternatives. To register now, or for more information, visit the ALCON website at:

http://www.alcon2010.astroleague.org/index.php

Also – if you represent a non-profit astronomy club, you may be eligible for a free exhibit table – contact us for more information. Please help us spread the word by forwarding this to anyone who may be interested.

See you all there!

Keith Schlottman

Ancient Supernova Riddle, Solved

By Dr. Tony Phillips

Australopithecus squinted at the blue African sky. He had never seen a star in broad daylight before, but he could see one today. Was it dangerous? He stared for a long time, puzzled, but nothing happened, and after a while he strode across the savanna unconcerned.

Millions of years later, we know better.

That star was a supernova, one of many that exploded in our corner of the Milky Way around the Pliocene era of pre-humans.
Australopithecus left no records; we know the explosions happened because their debris is still around. The solar system and everything else within about 300 light-years is surrounded by supernova exhaust—a haze of million-degree gas that permeates all of local space.

Supernovas are dangerous things, and when one appears in the daytime sky, it *is* cause for alarm. How did Earth survive? Modern astronomers believe the blasts were too far away (albeit not by much) to zap our planet with lethal amounts of radiation. Also, the Sun's magnetic field has done a good job holding the hot gas at bay. In other words, we lucked out.

The debris from those old explosions has the compelling power of a train wreck; astronomers have trouble tearing their eyes away. Over the

years, they've thoroughly surveyed the wreckage and therein found a mystery—clouds of hydrogen and helium apparently too fragile to have survived the blasts. One of them, whimsically called "the Local Fluff," is on the doorstep of the solar system.

"The observed temperature and density of the Fluff do not provide enough pressure to resist the crushing action of the hot supernova gas around it," says astronomer Merav Opher of George Mason University. "It makes us wonder, how can such a cloud exist?"

NASA's Voyager spacecraft may have found the answer.

NASA's two Voyager probes have been racing out of the solar system for more than 30 years. They are now beyond the orbit of Pluto and on the verge of entering interstellar space. "The Voyagers are not actually inside the Local Fluff," explains Opher. "But they are getting close and can sense what the cloud is like as they approach it."

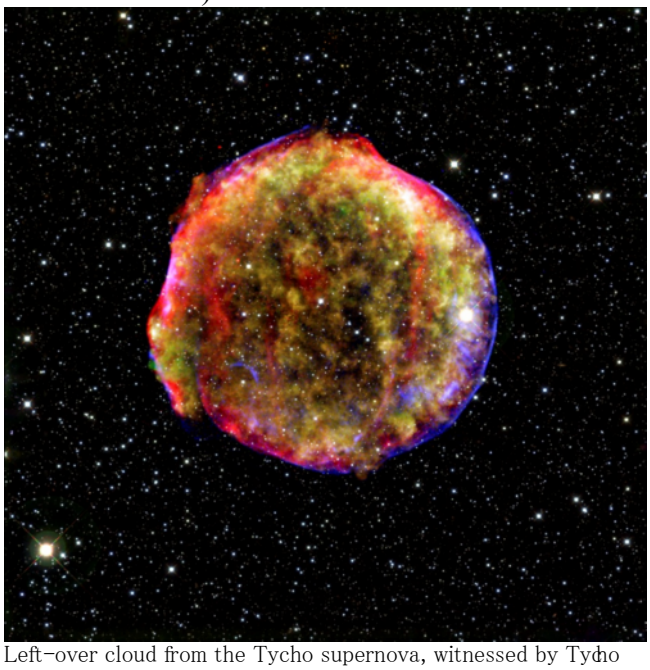
And the answer is …

"Magnetism," says Opher. "Voyager data show that the Fluff is strongly magnetized with a field strength between 4 and 5 microgauss. This magnetic field can provide the pressure required to resist destruction."

If fluffy clouds of hydrogen can survive a supernova blast, maybe it's not so surprising that we did, too. "Indeed, this is helping us understand how supernovas interact with their environment—and how destructive the blasts actually are," says Opher.

Maybe *Australopithecus* was on to something after all.

Opher's original research describing Voyager's discovery of the magnetic field in the Local Fluff may be found in *Nature*, **462**, 1036-1038 (24 December 2009).



Left-over cloud from the Tycho supernova, witnessed by Tycho Brahe and other astronomers over 400 years ago. This image combines infrared light captured by the Spitzer Space Telescope with x-rays captured by the Chandra X-ray Observatory, plus visible light from the Calar Also Observatory in Spain.

Bright ISS Passes Over Sierra Vista (from Heavens Above)

Date	Mag	Start	End
6 June	-3.4	04:39	04:45
7 June	-3.5	03:53	03:57
8 June	-1.5	04:16	04:20
9 June	-1.5	03:07	03:08
23 June	-1.7	20:09	20:13
24 June	-3.5	20:34	20:37
25 June	-3.1	04:32	04:38
26 June	-2.1	04:55	05:00
26 June	-3.4	19:41	19:47
27 June	-3.1	03:42	03:48

Amateur Astronomers Track Military's Secret Mini-Shuttle

Amateur astronomers have glimpsed beneath a cloak of secrecy shrouding the military's miniature robotic space shuttle, which was launched last month on a trial run.

The Air Force says its Orbital Space Vehicle, also known as the X-37B, is intended to test technologies for future space systems as well as demonstrate efficient turn-around processes to prepare the ships for flight.

Officials have been mum on how X-37B has been faring since it blasted off from Cape Canaveral Air Force Station on April 22. But thanks to the efforts of amateur photographers, we at least know where it is, which provides clues about what it's doing.

The first spotting of X-37B in orbit is credited to independent sightings from Greg Roberts of Cape Town, South Africa, and Kevin Fetter of Brockville, Canada, reports Tony Phillips with Spaceweather.com. Long-time satellite-watcher Ted Molczan of Toronto used the sightings to derive the satellite's orbit, which allowed Fetter to find it again May 21 as it passed by the star Sadalsuud in the constellation Aquarius.

The X-37B is now about as bright as the stars in the Big Dipper, says Phillips.

It is passing over the ground track once every four days, an orbit that is typical for U.S. spy satellites, according to Molczan.

The informal team of satellite watchers has discovered that X-37B is circling about 255 miles above the planet -- roughly where NASA's space shuttles fly -- in an orbit inclined about 40 degrees north and south of the equator. Forty degrees north latitude is about where Philadelphia is located. The X-37B, which is 29 feet long with a 14-foot wingspan, makes one orbit about every 90 minutes.

Like NASA's shuttles, the mini-spaceplane has cargo bay, which could be used to expose experiments and sensors to the space environment and/or launch and retrieve small satellites. It uses solar energy to produce electricity, rather than chemicals like the space shuttles, and can stay in orbit for up to nine months.

No word from the military on when X-37B will return from its debut flight.

Huachuca Astronomy Club P.O. Box 922 Sierra Vista, AZ 85636 http://www.hacastronomy.com, Yearly Membership: Individual: $25; Family: $35; Military: $20; Student:$10 (with restrictions); President: Wayne Johnson; Vice President: Glen Sanner, (520) 803-0576; Treasurer: Bob Kepple, (520) 366-0490; Webmaster: Del Gordon; Star Party Coordinator: Glen Sanner; Past President: Doug Snyder; Outreach Events Coordinator: Rich Swanson, (520) 803-7298; Loaner Scopes: Bob Gent, (520) 378-2915; Newsletter Editor: Mark Meanings