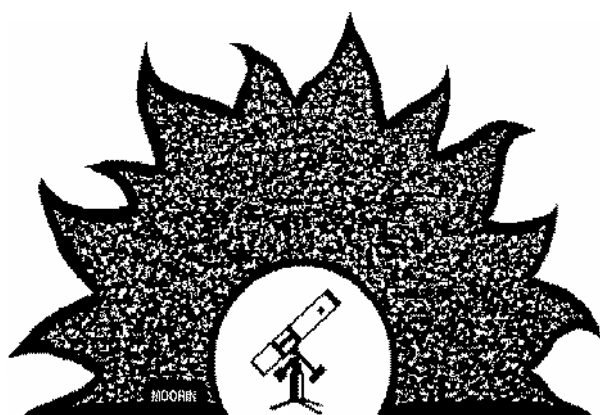




PAStimes

Phoenix Astronomical Society
www.pasaz.org

May 2009
Volume 60 Issue 9

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Mike Marron to be May 7 PAS Speaker

Mike Marron has a unique view of the formation of the universe...and Physics in general. He says "(my) Astrophysical solutions that explain how the larger universe and its many parts are created based mostly on Hannes Alfvén's principles of plasma physics."

The Lecture he will give May 7 is "Quantum Springs: building the universe from the smallest parts. Quantum springs are a simple fold in space that carries energy. Photons are made of large numbers of

quantum springs. Out of phase photons organize into neutrinos which when pulled apart become leptons. In my version leptons are arranged into quarks or the seventeen parts of a proton."

Marron is always a good speaker and we look forward to hearing him speak May 7. As usual the meeting starts at 7:00 with a half hour of fellowship followed by Marron's lecture and the voting. Water and possibly snacks will be provided.



April PAS Meeting Review

Photo and text By Terri, Event Coordinator

The April meeting was awesome! We had a guest from SAC, Rita. She had done a star party with Rod in the previous week and wanted to check out PAS. Welcome Rita! Thank you for attending.

We started with a discussion of Mike's lectures. He was telling us about the Museum tours he wishes to take us on prior to his lecture/star parties at his home in Carefree. The lecture series has begun and you can find out more about it at this document on our website: Mike's 2009 Lecture Series <http://www.pasaz.org/forums/downloads.php?do=file&id=102>.

Our planned speaker for the evening contacted me a few days prior to the meeting saying that he was sick and could not make it to this meeting. So, I sent out a request that anyone who would like to do a presentation on this night, please let me know. Sonny had already had his presentation ready for the May meeting, and thus, decided to do it a month early. Many many thanks goes to Sonny and to Rod for prepar-

ing the power point portion of the talk. Sonny did a fantastic job with his presentation on The History of Astrophotography. I'd love to see him expand this presentation with more info, and do it again at some time in the future. Maybe as a public presentation followed by a star party at North Mountain Park. The topic and research he covered was very good, and well thought out and planned. And he had good interaction with the attendees. Thank you so much, Sonny!

At this meeting, I wish to thank a few people for their help. Don wasn't able to make it so I did the photography this time. Elaine helped out with Snacks. Elaine will be voted in, at the May PAS meeting as our new Hostess. Her position will be to cover for John Pulis in his absence, should he be absent, and help me set up the handouts & snacks prior to each meeting. I wish to thank Sam for bringing the Popcorn. Again I missed out, but bringing it is appreciated by all. Bob S. provided some of the snacks. Previously Bob purchased a box of individually wrapped Oreos, like months ago, and left them in my care. So, each meeting, I

bring 2 packs. We usually only go through one pack, and the other one goes home to come back another meeting. Thank you Bob. I wish to thank John Pulis for being an awesome Host. He is right there helping out every chance he gets. And everyone was saying that it was an awesome idea to have such healthy snacks brought by Elaine at this meeting. It was a nice change from the usual sugared snacks.

It was a short but good meeting. We had plenty of snacks, drinks, fun, and an awesome guest speaker. Photos for this meeting can be seen on our site www.pasaz.org in the Photo Gallery. Enjoy! Thank you all for attending. See you at the May PAS meeting!!! ***



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Remote Control A Telescope?

By Steve Palmer

Have you ever wanted to take pictures of your favorite galaxies, star clusters, planets or general deep sky objects? Have you ever wanted to get into astrophotography, but didn't have the cash to purchase the equipment needed, or unsure about what equipment is needed or what to buy? Well fret no more! There is a solution now available. How would you like to have a star imaging party at selected members homes (inside) and have access to all the necessary astronomy equipment setup miles away? You just wait for your selected session time. Then sit down to the laptop, plug in your pre-selected image planning session and kick off your routine and wait for the program to finish imaging. Then copy the files over to your flash drive and take them home to process as you see fit.

Well, The club (via Chris Johnson), would like to propose and put up for a vote at our next meeting, on the purchase of one license copy of ACP software \$695.00. The only cost to the club will be the cost of the software interface. Chris will be providing at no cost to the club, access (via the Internet) of his entire advanced imaging telescope setup (\$100k plus) equipment at the observatory and to others equipment at a later date. This will allow club members to learn more about and have access to professional level Astrophotography equipment to take photos of targets they select (without having to make the large investment in all the equipment required). This capability will be similar to other services available now i.e. (Lightbuckets: <http://www.lightbuckets.com/> or GRAS - <http://www.global-rent-a-scope.com/>) to list just a couple. These are more expen-

sive per hour vs having our own club regulated access times and the personal assistance available to the user during their individual booked telescope time. We could have some tutorial classes to teach users how to create their planning sessions and how to execute it. Plus, we will have someone trained on the system available with the laptop to help with possible problems during their session.

See below screen shots / program information for more detailed explanation. Then join us at the next meeting to vote on this issue. For further program videos, features and benefits please go to their site.

The ACP programs link is:

<http://acp.dc3.com/features.html>

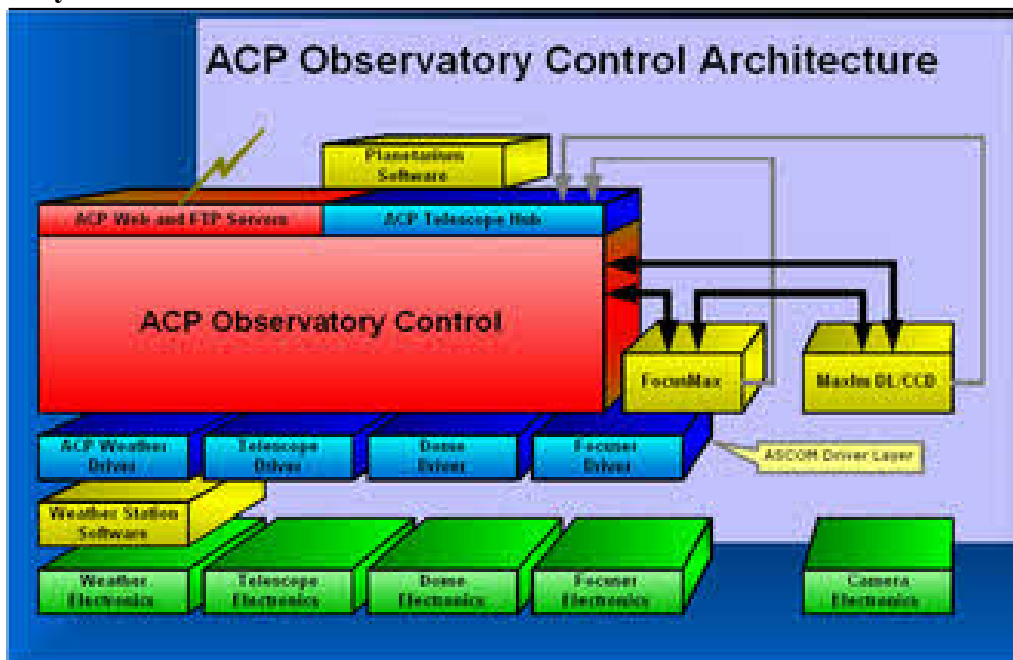
What Will ACP Do For Me?

That's easy. Everything is automatic. Really. Use our [ACP Planner](#) to create a single- or multiple-target observing plan (you don't have to know how to script!). Then click a button, select your observing plan and go to bed. The plan will automatically use ACP's incredible set of features, just some of which are listed below.

Multiple Targets	Dynamic Visual Planning	Separate Planning & Observing
Every Image Centered™	Self-learning Pointing Corrector	Imager Rotator Control
Adaptive Auto-Guiding	Adaptive & Periodic Auto-Focus	Filter Focus Offsets
Dome and Roof Control	Weather Safety	Automatic Sky Flats
Auto-Calibration	Auto-Flip During Repeat-Sets	Image Stacking of Repeat-Set
Solar System Ephemerides	NEOCP Ephemerides	Orbital Tracking
Starfield Simulator	User Script Hook-Points	70,000+ Deep Sky Objects
Observing Plans	Plan Repeats (sets)	Chaining Plans
Browser & FTP Access	Auto-Astrometry	Limiting Mag & Airmass

And if that's not enough, ACP can be customized for special missions through custom scripting. There are hundreds of library objects, properties, and methods for astronomical applications available to ACP script developers. This is no black box!

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ACP Planner

ACP Planner™ (Patent Pending) gives you a visual way to create a night's **multiple target** observing plan within Starry Night or TheSky. This way of planning is a quantum leap beyond other tools and automation systems because it lets you visualize your target positions and timing together dynamically and do task-oriented planning. It makes it very easy (and very fast!) to pick which targets to image at what times and for how long. There's no need to tell ACP to slew, take images, focus, guide, etc., because it's smart enough to figure out what things are needed and when. An ACP plan is just a list of targets with image/filter specs and optional timing info.

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Upcoming PAS May & June Events

By Terri, Event Coordinator

It is that time again, when the newsletter lists 2 months of events at a time. PAS produces a newsletter for the months of Sept, Oct, Nov, Dec, Jan, Feb, Mar, Apr & May. Then we have one in the summer just to update any changes to the schedule, for July & Aug.

Please note that any event marked "Private" is for PAS members only. Public is invited to all others. Please RSVP where requested. Phoenix Monsoons are June 15 to Sept 30 each year.

MAY EVENTS

May 1: We have 2 awesome private star parties to start off the month.

Sunset Ridge whole school star party from 6pm to 10pm. Volunteers are needed. RSVP with Terri. More details about this event can be found in the Calendar & in the forums on our site.

Camp Sombrero 70 Girl Scout star party from 6pm to 10pm. Volunteers are needed. RSVP is with Bob Christ. More info can be found in the calendar & forums on line.

May 7: PAS Meeting. Guest Speaker will be Mike Marron. Read about it on page 1. We also will have 2008 Year in Space Calendars available in trade for a donation to PAS. We will have a silent vote for NSN Awards.. And the major part of this meeting will be the Elections. Articles on each of these topics are within this newsletter, should you desire more info on the upcoming

PAS meeting. See each topic as an article, separately.

May 16: 3rd Quarter Moon star party in High Desert Park in Black Canyon City. RSVP with Rod. Event is 7pm to whenever. Public is welcome. \$2/car donation required to pay park for its use. If no public RSVP's, this event will be canceled. Highlights: Saturn, Moon, Jupiter, Venus, & Mars. See details in calendar for this event.

May 22: Shadow Mountain HS "Private" Star Party - 7pm to 10pm. Volunteers are needed. RSVP is with Terri.

May 23: Mike's Astro Physical Lecture Series continues with part 3 of 5. You can read about these lectures & the Carefree tours that are offered with them in the document on line at: <http://www.pasaz.org/forums/downloads.php?do=file&id=102>. RSVP is with Mike. Only the star party portion of these events is weather permitting. All else will happen rain or shine.

May 23: CEO Star Party, Friday afternoon to Sunday noon. Arrive well before dark. Serious viewers only, & PAS members only. Donation to PAS required for non PAS members. RSVP is with Chris, as well as directions & maps. See info about this star party in the PAS Calendar. From Noon 23rd to Noon 24th.

May 28: PAS Meeting of the Minds 7pm to 10pm in G-147. PAS Business meeting. No Children. Open to the public.

This meeting is canceled if there are not enough topics to hold the meeting. Verify its status with Terri.

JUNE EVENTS

June 4: PAS/PVCC Star Party. Open to the public. We set up by the telescope domes by G-147 and show the sky to everyone! RSVP is with Terri. 6:30 to 10pm. Highlights for this evening will be Moon & Saturn.

June 13: 3rd Quarter Moon star party in High Desert Park in Black Canyon City. RSVP with Rod. Event is 7pm to whenever. Public is welcome. \$2/car donation required to pay park for its use. If no public RSVP's, this event will be canceled. Highlights: Saturn, Moon, Jupiter, Venus, Mercury & Mars. See details in calendar for this event.

June 20: Mike's Astro Physical Lecture Series continues with part 4 of 5. You can read about these lectures & the Carefree tours that are offered with them in the document on line at: <http://www.pasaz.org/forums/downloads.php?do=file&id=102>. RSVP is with Mike. Only the star party portion of these events is weather permitting. All else will happen rain or shine.

June 25: PAS Meeting of the Minds 7pm to 10pm in G-147. PAS Business meeting. No Children. Open to the public. This meeting is canceled if there are not enough topics to hold the meeting. Verify its status with Terri. ***

Dream Finally Realized

By Bob Christ Photos Courtesy Bob Christ

For many years I fondly associated the term "Southern Cross" as being something distant and adventuresome, my thinking incited by my exposure to the term's use in film; I simply liked the sound of the name.

Years ago I attended a cruise ship lecture about the Southern sky while sailing the waters of French Polynesia and learned the Southern Cross is a recognizable object in the sky; this before I became actively engaged in astronomy. I also learned that there are false crosses that can be mistaken for the real deal. The lecturer said to liken the Southern Cross to a baseball diamond. The brightest star is home plate, and there is a "base runner" between home and first – a star not present in the false crosses. Armed with this information, I proceed to look for the Southern Cross each night and was greeted with cloudy skies.

Not to be deterred, several years ago my wife and I took a cruise throughout Asia that began in Singapore and I was sure I would be able to "bag" the Southern Cross during this trip. Not so. Again the skies were cloudy each evening: foiled again. I am detecting a pattern here: cruise ships + ocean + sky = disappointment.

This month (Editors note: This was received in March 2009)my wife and I took a cruise around South America and I was prepared with a Southern Hemisphere chart from SkyMaps.com and pages copied from my Sky & Telescope Pocket Atlas. Not only was the target the Southern Cross, but now also Omega Centauri. "If I cannot see one object, perhaps I cannot see two."

We lodged in Valparaiso the night before boarding the ship and late in the evening I climbed to the roof of our mini-hotel and looked up. There it was in all of its glory: the Southern Cross. I was ecstatic! The sky was not perfect and I could not detect the "base runner," but knew I was on the real cross, guided by the pointer provided by Alpha and Beta Centauri. Exhausted from the plane trip, I had forgotten to take my binoculars with me to glance at Omega Centauri. One for two.

Out at sea, once again the formula for disappointment prevailed for a string of nights until the ship had reached southern Chilean waters. On the first cloudless evening, I looked up and there was the Southern Cross, poised about 50 degrees high in the sky! Using my 9x25 (non-astro) binocu-



Sunset at sea in Chile



Bob and his wife Carol at the San Raphael glacier in Chile.

lars, I was also able to bag Omega Centauri. Two for two!

Following a conversation with the Cruise Director, he asked if the captain could turn off the lights on Deck 11, the highest one, at some point to view the sky. On the evening of March 25, the sky was clear and at 11PM the lights on Deck 11 were turned-off. The Milky Way simply jumped out, and the 50-60 of 303 passengers that stayed awake beyond their bed-times were treated to a wonderful sight that most have never seen. I pointed them to the:

Southern Cross, one of the false crosses, Sirius (sky's brightest star), and half of the winter hexagon (Sirius, Procyon, and Pollux/Caster) because the remaining 3 stars had settled below the horizon "taking Orion" with them. I was a great time.

My quest had been satisfied, save for one downside: I missed this year's Messier Marathon. Oh well, next year's marathon will roll around all-to-quickly.

Clear skies.

PAS OFFICER ELECTIONS 2009

Be at this meeting to help choose our next leaders.

By Terri, Event Coordinator

Our current Officers include the following:

Rod Sutter, President
Terri Finch, Vice President
Don Boyd, Newsletter Editor
Mike Marron, Treasurer
John Pulis, PAS Host

We will be holding elections at the

May PAS meeting. I have not heard of any officers changing their positions at this time, however, it is not too late to step down, if needed and let someone else take the position.

Remember, If you give up your position, you must provide the PAS Name Badge with the position (Editor, President, Treasurer, etc) to the new Officer at this PAS meeting. That is part of the election process.

If you are considering running for a

position, prior to the PAS meeting, please notify Terri so she can put you in the list when the position is being offered, during elections.

I would like to nominate Elaine Le-Tarte as PAS Hostess. Along with John Pulis, or in his absence, her assistance would be greatly appreciated.

If you have a nominee, or want to run for office, Terri is the one to talk to prior to the start of the May PAS meeting. We will see you there! ***

PAS LISTSERVE

By Terri, Event Coordinator

What is a PAS Listserv. A listserv is a list of people who wish to receive emails from a certain source. For instance, If you sign up on the PAS Digest Blog that I keep updated, then you are signing up with a group of people who also want to know what is going on with PAS, through the PAS Blog.

So, what does that have to do with the PAS Listserv? Well, Chris and I are forming a listserv that will give PAS Members the knowledge of NON PAS events that may be coming up. An example would be the Thunderbird Park star party that SAC hosts every year. We do not put NON PAS

events on our calendar, for the most part, so I was looking for a way to get this kind of NON PAS event info out to everyone without posting it within the forums or putting it on our calendar since it is not a PAS event.

Several PAS members have signed up for this listserv. To get on the list, just drop Terri an email and she will see that you are added. Only when NON PAS events are being posted, will you receive an email from that list. And the name of it will be recognized as a NON PAS event. I believe I had the name picked out as AZAstroEvents@pasaz.org.

At the moment, on the poll we have active on line until May 3rd, we have votes

to keep this list to PAS MEMBERS ONLY. What is the advantage? Do we want NON PAS folk to know of other events, other clubs may be holding? I guess we all agree to keep this within PAS. So, only PAS members will be allowed to sign up for the list. When your membership expires, you will be removed from the list. Or you can be removed by emailing our webmaster at any time.

If you haven't already voted, the polls are still open for a few more days. Put your thoughts into the poll and read all about it in the forums at:

<http://www.pasaz.org/forums/showthread.php?t=246>. ***

Night Sky Network Award Pin 2009

By Terri, Event Coordinator

The Night Sky Network is an entity that PAS works with to promote astronomy. For being active in PAS, NSN gives us 3 pins to award. At the May PAS meeting, we will be giving these three awards - Pins seen at this link on Right:

<http://www.pasaz.org/forums/showthread.php?t=254> to the three most active members of PAS. ONLY PAS members will be voting. I will be bringing a prepared, typed list, 1/4 size sheet of paper, for each PAS member to vote on 3 active members of their choice. Prior to the voting, we will have

each member on the secret ballot stand and give their name. Then we will vote and award the Pins after the guest speaker. We have had this awesome opportunity to have these pins, for the past 2 years. This is a great award. Be proud and wear it to every event! ***

INTERNATIONAL YEAR OF ASTRONOMY 2009

By Terri, Event Coordinator

At the May PAS meeting, please pick up your pin. Those who are extra active in the club, and who attend star parties, may wish to have one of these pins, the pin on the left at this link:

<http://www.pasaz.org/forums/showthread.php?t=254>

to show their activeness in promoting astronomy during IYA 2009.

I've only given away 2 of the 12 I have available. If you want one, reserve your pin by letting Terri know prior to the PAS

meeting. I will be passing them out, based on the first 12 names I receive. If you missed picking up your pin last month, I still have it as long as I sent you back verification I got your request for one of the pins. Thanks and see you at the May PAS meeting! ***

Arizona Sky



By Leah Sapir

Last month we talked about a few galaxies; this month we'll talk about a lot more of them!

In the summer, we are facing the center of the Milky Way; in the winter, we are facing our galaxy's edges, but still looking through the galaxy in the "thick" direction. In the spring and autumn, we are facing towards the thin dimension of our galaxy – looking outwards, towards the galactic poles – a perfect time to see deep into space!

Just east of Leo, we can see the Virgo Cluster of galaxies. The Big Dipper helps us locate it: we "follow the arc" of the Dipper's handle to Arcturus, in Bootes; then "speed over" to Spica, the brightest star in Virgo.

A little to the west of Virgo is a large trapezoid, back-to-back with the Big Dipper, that forms the body of Leo the lion. When the Big Dipper is up in the northern sky, Leo is directly opposite in the south. The bright star at the end of the lion's body (the southeast corner) is Denebola.

The Virgo galaxy cluster (which also extends into Coma Berenices, north of Virgo) includes at least 2000 galaxies, and it is possible that our own Milky Way is one of its outlying members. Most of these galaxies are about 60 million light years away – practically a hop, skip and jump in astronomical terms. But in human terms, it's quite a

distance! The light that we see tonight left these galaxies when dinosaurs were still roaming the earth – but towards the end of their reign, just before they were wiped out by an asteroid. (Or, depending on how we estimate the distance to the cluster – maybe it was just after the dinosaurs became extinct, when the first early mammals were recovering from the asteroid's impact.)

We are currently moving away from the Virgo cluster, but due to the cluster's great mass, it is possible that billions of years from now, the Milky Way will begin to be drawn towards the cluster, eventually merging with it. Imagine what our sky

would look like then! Of course, we won't be around to see it....

Many of the galaxies in the Virgo cluster, including 16 Messier objects, are considered to be "easy" objects for telescope viewing, but they do require dark skies.

We can use Denebola as our "jumping off point" for finding some of them. About 7 degrees east of Denebola is a group of three 10th-mag galaxies, and many fainter ones. The three brighter galaxies - M98, M99, and M100 - form a triangle about 2 degrees across. An additional bright galaxy, M85, is about 2 degrees northeast of the group. All four were discovered by Pierre Mechain, Charles Messier's observing partner, in 1781.

M100 is a "grand design spiral" with two prominent spiral arms where intense star formation is taking place. In recent decades there have been several supernovae in M100, including one in 2006.

M99 has asymmetric spiral arms, probably from interaction with other galaxies in the cluster. M100 is a little larger than the Milky Way (115,000 light years diameter) while M99 is only about 50,000 light years across.

Last month we talked about Lord Rosse and his discovery of spiral structure in the Whirlpool Galaxy, M51. The second "nebula" in which he found spiral structure was M99, and M100 was among the first 14.

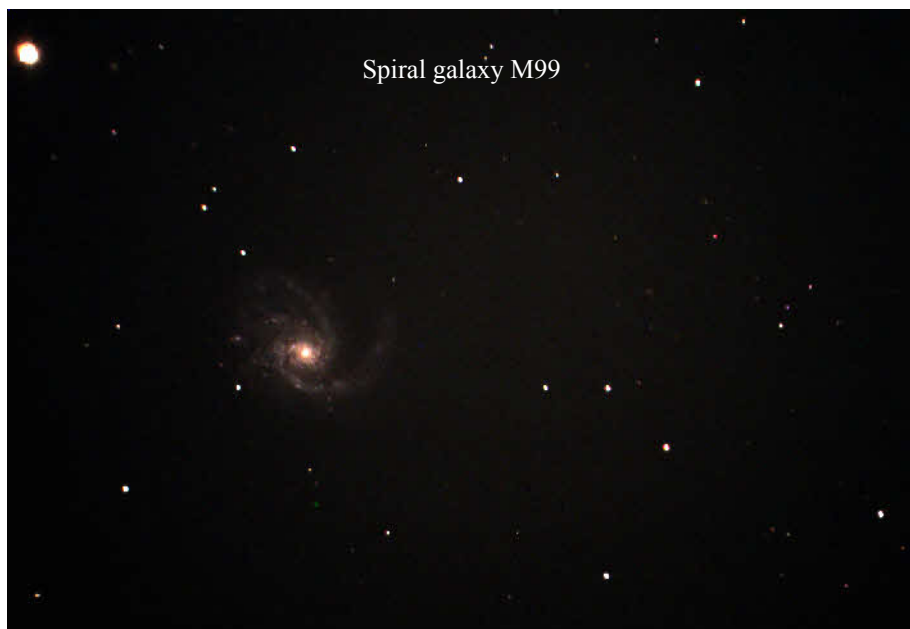
M99 and M100 are face-on spirals, and M98 is an edge-on spiral. M98 is quite a large galaxy – 155,000 light years across.

Although in general the Virgo cluster is moving away from us at a speed of about 700

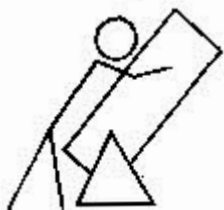


Spiral galaxy M100 with companions barred spiral NGC 4322 above and spiral NGC 4328 at left

Images Copyright Slooh



Spiral galaxy M99



Arizona Sky

miles/sec, M98 is approaching us at a speed of about 80 miles/sec – causing some observers to wonder whether M98 is actually a member of the cluster. The general consensus is that M98 is part of the Virgo cluster, but it just has its own proper motion.

In comparison to the three spirals, M85 is a “lenticular” galaxy. Lenticular galaxies are flat and lens-shaped, with a central nucleus like spirals, but without spiral arms. Like elliptical galaxies, they contain older stars, and very little interstellar gas. M85 is about 110,000 light years across.

A short distance southeast of this group (3 degrees south of M100 and 2 degrees southeast of M99) is an interesting pair of lenticular galaxies: M84 (about 100,000 light years across) and M86 (about 150,000 light years). These are part of a string of galaxies known as the “Markarian chain” after the Russian astronomer who pointed out the association in 1961. It seems that M84 and other galaxies at the western side of the chain are moving towards us, while the galaxies on the eastern end are moving away from us.

M84 is also notable because of its active nucleus, which produces strong emissions at radio wavelengths – probably due to the presence of a huge black hole.

But looking at a picture of M84, M86, and nearby galaxies, one can't help but smile. With these two galaxies as “eyes”, and smaller nearby galaxies as nose, mouth, and eyebrow, they form “the great smiley-face in the sky”.

M84 and M86 are not far from the center of the Virgo cluster. Only about one degree away (equivalent to an actual distance of about a million light years) is a giant elliptical galaxy, M87, located close to the center of the cluster. M87 is about 120,000 light years in diameter, only a little wider than the Milky Way, but it contains a huge amount of mass – about 3 trillion solar masses, which is about 5 times as massive as the Milky Way, and hundreds of times more massive than many smaller galaxies. It has an active nucleus, a massive black hole, and a jet of material shooting out from its surface for a distance of thousands of light years, at a speed close to the speed of light. The jet was discovered by Heber Curtis in 1918, and can be seen in photographs of M87.

M87 also has lots of globular clusters – an estimated 13,000, compared to the Milky Way's 150-or-so globs.

Closer to home - Mercury begins the month as an evening star, beautifully locat-

ed next to the Pleiades, and staying up for over an hour after sunset; but it sets earlier from day to day, and fades into the sunset by mid month. It begins to reappear as a morning star by the end of the month, but won't be really visible till June.

Saturn is high in the south at sunset and is up for most of the night, setting around 3 a.m. at the beginning of May, and 1 a.m. at the end of the month. In the meantime, Jupiter is staying up longer each night. It rises at 2 a.m. at the beginning of the month and around midnight by the end of the month. Venus and Mars are still morning stars, rising close to dawn, but a little earlier each day: around 4 a.m. at the beginning of the month, and 3 a.m. at the end of the month.

The first-quarter moon will be close to Saturn on the evening of May 3-4 and May 30; the third-quarter moon will be close to Jupiter in the early morning hours of May 17; and the crescent moon will make a nice little group with Venus and Mars before dawn on May 21.

Join us next month when we continue to explore the spring and summer constellations. And till then – wishing you clear skies, and happy observing!

THANKS FROM CHAPPARRAL H.S.

By Robert Mattisinko

A big THANK YOU goes out to the crew that showed up and made it Chaparral hs best star party yet. Please forward to Chris, Steve, Mike, Mrs. Peck, Rod, and anyone else there. I want to feed you guys next year! I will also improve upon it with station sign-in sheets and such. All the students were blown away, job well done. Thanks, ***

BOY SCOUT SPACE DERBY SENDS THANKS TO PAS

I just wanted to Thank You and your group for helping make our Space Derby a huge success! Even with the frustration that we couldn't get all of the exterior lights off, as I was told they would be! The scout's and their parents were very impressed by the knowledge and experience of your group and were excited to see Saturn! An extra, Thank You, to Mr. Marron - his collection of meteorites was fascinating and a nice addition to the scout's education.

Thank you! Hopefully we will see you all again next year!

Jennifer Stupski

Cub Scouts Pack 134

2008 Year in Space Calendar for Donation

By Terri, Event Coordinator

At the May PAS meeting, it was decided to allow a PAS member to donate \$2+ to PAS in trade for the 2008 YIS Calendar I have been carrying around for a long time, hoping to get it to its owner. I heard from Steve and he said donate it. So, I'm offering it for a small donation to PAS. First to approach me, gets it. I am still waiting on an answer from the other 2008 calendar owner as to what to do with her calendar. If she gets back to me in time, I will have 2 of them to put up for donation. You want the calendar, give me a few dollars that you are donation to PAS, and I give you the calendar. Nice, simple trade. ***



The Swiss Army Knife of Weather Satellites

Spotting volcanic eruptions, monitoring the health of crops, pinpointing distress signals for search and rescue teams. It's not what you might expect from a weather satellite. But these are just a few of the abilities of NOAA's newest polar-orbiting weather satellite, launched by NASA on February 6 and turned over to NOAA for full-time operations on February 26. Formerly called NOAA-N Prime and now renamed NOAA-19, it is the last in its line of weather satellites that stretches back almost 50 years to the dawn of the Space Age. Over the decades, the abilities of these Television Infrared Observation Satellites (TIROS) have gradually improved and expanded, starting from the grainy, black-and-white images of Earth's cloud cover taken by TIROS-1 and culminating in NOAA-19's amazing array of capabilities. "This TIROS series has become quite the Swiss army knife of weather satellites, and NOAA-19 is the most capable one yet," says Tom Wrublewski, NOAA-19

Satellite Acquisition Manager at NASA's Goddard Space Flight Center in Greenbelt, Maryland. The evolution of TIROS began in 1998 with NOAA-K. The satellites have carried microwave sensors that can measure temperature variations as small as 1 degree Celsius between Earth's surface and an altitude of 40 kilometers—even through clouds. Other

missions have added the ability to track large icebergs for cargo ships, monitor sea surface temperatures to aid climate change research, measure the amount of ozone in Earth's protective ozone layer, and even detect hazardous particles from solar flares that can affect communications and endanger satellites, astronauts in orbit, and city power grids. NOAA-19 marks the end of the TIROS line, and for the next four years it will bridge the gap to a new series of satellites called the National Polar-orbiting Operational Environmental Satellite System. NPOESS will merge civilian and military weather satellites into a single system. Like NOAA-19, NPOESS satellites will orbit Earth from pole to pole, circling the planet roughly every 100 minutes and observing every location at least twice each day.

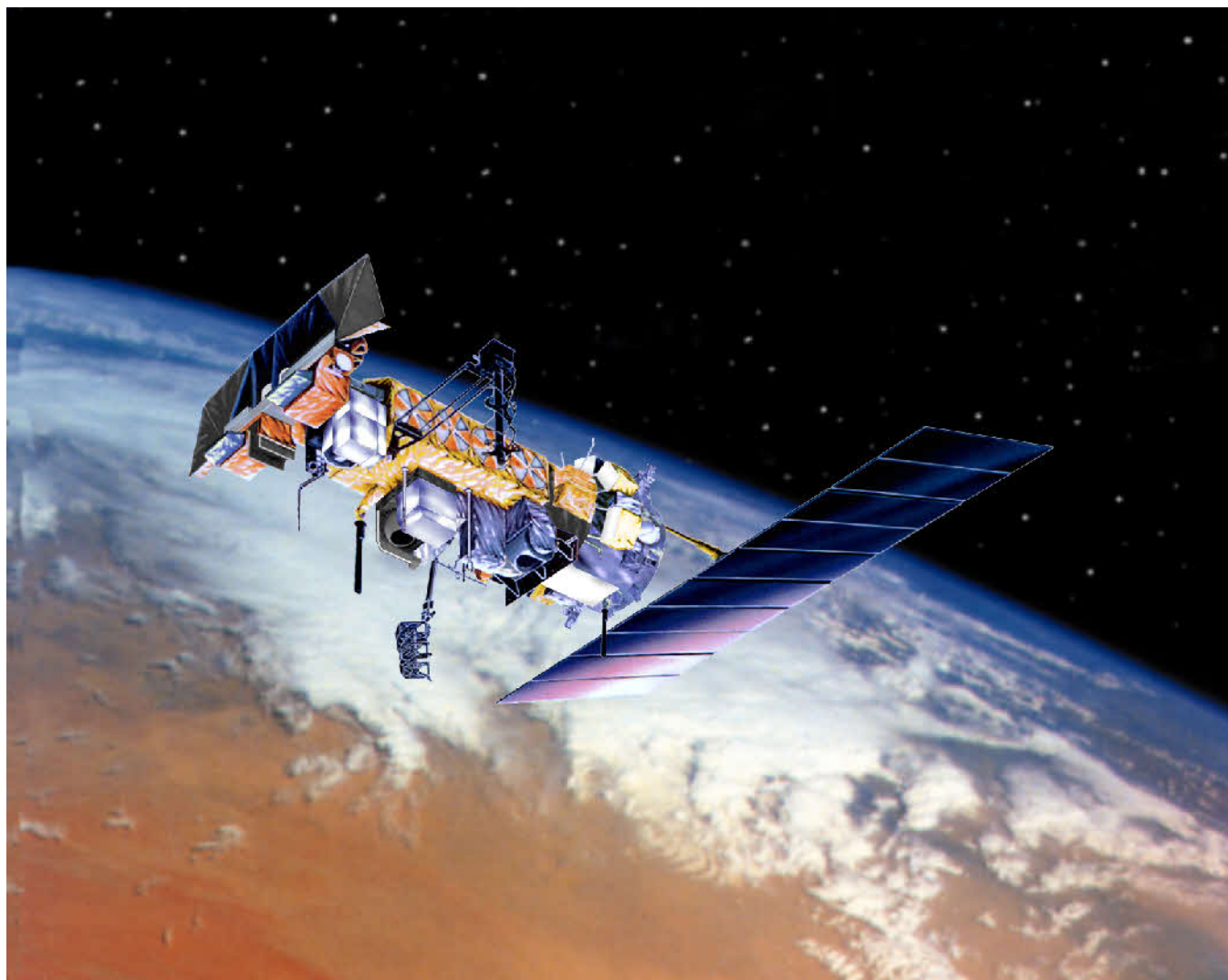
NPOESS will have yet more capabilities drawn from its military heritage. Dim-light sensors will improve observations of

the Earth at night, and the satellites will better monitor winds over the ocean—important information for ships at sea and for weather and climate models. "A lot more capability is going to come out of NPOESS, improving upon the 161 various environmental data products we already produce today," Wrublewski says.

Not even a Swiss army knife can do that many things, he points out.

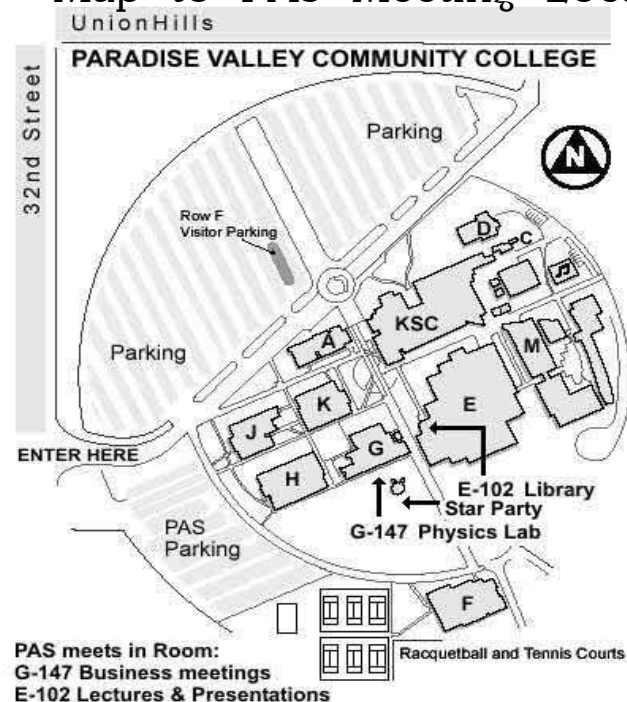
For more on the NPOESS, check out <http://www.npoess.noaa.gov>. Kids can find out about another NOAA satellite capability—tracking endangered migrating species—and play a fun memory game at http://spaceplace.nasa.gov/en/kids/poes_tracing.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

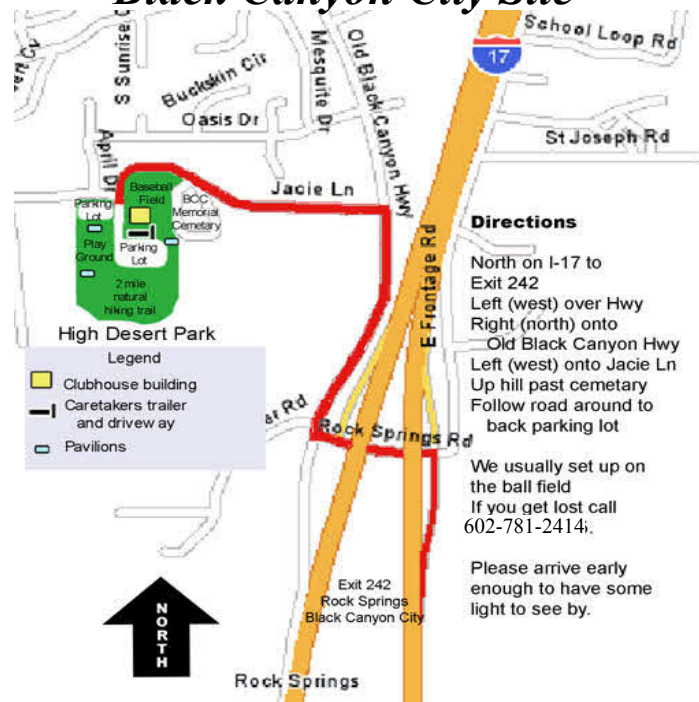


The new NOAA-19 is the last and most capable in the long line of Television Infrared Observation Satellites (TIROS).

Map to PAS Meeting Location



Black Canyon City Site



Mike's Summer Lecture Series

By Mike Marron

Astrophysical solutions that explain how the larger universe and its many parts are created based mostly on Hannes Alfvén's principles of plasma physics.

May 7, 2009 library at Paradise Valley Community College 7:00 PM. Quantum Springs, building the universe from the smallest parts. Quantum springs are a simple fold in space that carries energy. Photons are made of large numbers of quantum springs. Out of phase photons organize into neutrinos which when pulled apart become leptons. In my version leptons are arranged into quarks or the seventeen parts of a proton.

The following lectures are held at my home in Carefree. Early events starting at 1:00 PM could be museum tours. Telescope and potluck setups start at 5:00 PM the lectures begin at 6:00 PM and end around 8:00 PM. Weather permitting, people who bring telescopes are invited to enjoy these dark skies nearest new moons. Bring food and drinks to share. This is the real desert with wildlife but telescopes require darkness. Flashlights must have a red filter. Careful smoking permitted outside, wild grass and brush is a major fire hazard. Call Mike at 480-488-3031 or email

primefactory@q.com to RSVP and get directions. Leave contact information in case of cancellations. These lectures are part of Phoenix Astronomical Society's many events, to learn more contact www.pasaz.org.

May 23, 2009. We start early with a tour of the Cave Creek Museum 6140 Skyline Dr., Cave Creek at 2:00 PM. This is a public museum of Cave Creek history \$3 or \$2 senior (55 up). Meet at my place between 1:00 PM and 1:30 PM and caravan. We will be back at 5:00 PM for my lecture at 6:00 PM on the Solar Systems Tails of Plasma. Part 1 teaches how the solar wind is focused into magnetohydrodynamic systems. The physics demonstrated by the nearby magnetotails of comets, planets, and moons will be used to explain the relativistic jets of stars in part 2 and the massive particle beams of galaxies in part 3. Once understood powerful new techniques become available to find the physical properties of exosolar planets. Fusion in metallic population I stars, such as our sun, is guided by its core's magnetic fields in a manner similar to planetary auroral ovals.

June 20, 2009. We start early with a

tour of the Heard Museum North 34505 N. Scottsdale Rd., at 2:00 PM. This is a public museum of Indian history \$5 or \$4 senior (65 up). Meet at my place between 1:00 PM and 1:30 PM and caravan. We will be back at 5:00 PM for my lecture at 6:00 PM on Stellar Jets, Tails of Plasma part 2. Stars are born in Herbig-Haro jets during cloud to cloud collisions. Often stars have their stellar winds blown into comet like tails by more powerful interstellar winds. Even as they die star create powerful beams. Binary and multiple stellar systems have complex jets that can be nearly as fast as light if a member is a dwarf, neutron, or black hole star. Detailed histories of each of these stellar systems are written in interstellar space by these particle beams.

July 18, 2009. Galactic Jets and Physical Evolution, Tails of Plasma part 3. This lecture describes the births and the formation of structures within dwarf, spiral, and elliptical galaxies. Since the 1990's a large range of dark galaxies have been discovered. New details on how the oldest low metal population II stars are born and evolve. I will cover the origins of matter, the long term history of the universe, and its future.

Ads in PAStimes

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May Meeting Voting Topics:

- * Club Purchase ACP Software (Page 2)
- * Night Sky Network Pin awards (Page 5)
- * PAS Officer Election (Page 5)

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What’s Up For May?

By Rod Sutter, PAS President

Planets

Name	Date	Rise	Set
Mercury	05-1-09	06:35	20:45
Venus	05-1-09	03:51	16:03
Mars	05-1-09	04:11	16:24
Jupiter	05-1-09	02:09	12:56
Saturn	05-1-09	14:34	03:19
Uranus	05-1-09	03:41	15:32
Neptune	05-1-09	02:12	13:04
Pluto	05-1-09	22:45	09:11

All Times Arizona Time

May 15 2009

Sunrise: 05:31
Sunset: 19:19



Q1: May 1



Full: May 9



Q3: May 17



New: May 24