The Focal Point

The Atlanta Astronomy Club
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Editor: Keith Burns

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Comments From The Editor

Keith Burns

I just wanted to let you know that I will be changing a few things about the Focal Point. Hopefully these changes will make it easier for people to find the information they are looking for. After all, the Focal Point is the one thing that all members get. It is the source for all club happenings.

I was hoping to include some info about comet Linear 1999 S4. Unfortionately the idea like the comet has broken into pieces and fizzled out. About 15 AAC members went to Huntsville to visit the Marshall Space Center and Von Braun Astronomical Society. We had a blast and made some new friends along the way. In the coming months there will be a write up about the trip. Stay tuned.

Astronomy and weather oftend conflict with one another. In the past two weeks, I've had four close encounters with lightning. Too close for my comfort. It may look cool but it's not fun when a bolt strikes nearby. Lightning struck the house and hit the weather computer I was holding in my hand. Luckly for me, the weather computer was properly grounded. My desktop computer was safely unplugged but the weather computer was not. So we have a Focal Point this month, but I couldn't tell you what the current weather condictions are. I suggest that in the future that everyone should include with their observing gear a lightning ground rod. You can never be too safe. Those clear hill tops are great for viewing until one of those thunderstorms decides to pay you a visit. Just ask Roger Dowiat, Wilkie Brown, Jerry Tarter, and Keith Burns. The trick is to get someone to hold the rod while the rest of us move to a safer spot.

The Story of Vulcan

by Leonard B. Abbey, F.R.A.S.

The great impetus given to planetary astronomy by the discovery of Uranus in 1781, the major asteroids in 1801-4, and Neptune in 1845 spurred many astronomers to turn their attention to this field. Theoretical work done by the great French mathematician Leverrier had been a prime factor in the discovery of Neptune by Galle in Berlin. In fact, his calculations had been the sole cause of that discovery. (Of course, the English mathematician John Couch Adams had made similar calculations which pre-dated the Frenchman's work, but Adams' predictions were ignored by Astronomer Royal Airy until after Galle had discovered Neptune - using Leverrier's work.) A little taste of the fame associated with the discovery of a new planet goes a long way, and Leverrier began to look for new possibilities.

The unexplained advance of Mercury's perihelion soon attracted him. He deduced that this advance could be explained by either assuming Venus to be 1/10th more massive than had been thought, or by postulation an intra—Mercurial planet. By this time the relative masses of all known major members of the solar system had been worked out to a reasonably accurate degree, so Leverrier began to investigate the possibility of another planet. In 1859 he published his preliminary findings.

In response to Leverrier's paper, a physician and amateur astronomer named Lescarbault announced that he had observed the passage of an object, which he took to be the new planet, across the sun's disk. A minor earthquake shook the astronomical world. Many observers wrote excitedly to the reticent doctor seeking further information, but he was reluctant to reply to such correspondence pending more definite results. Being unable to communicate with Lescarbault in any other way, Leverrier journeyed to Eure-et-Loire to seek a personal interview.

At that time Leverrier was the lion of the European intellectual community, and was highly aware of his fame and achievements. As a matter of fact, he was known to be rather egotistical and pompous. Imagine Lescarbault's surprise upon answering his door when he was confronted by this arrogant and angry man, who refused to identify himself, and began as follows: "It is then you, sir, who pretend to have observed the intra - Mercurial planet, and who have committed the grave offense of keeping your observations secret for nine months. I warn you that I have come here with the intention of doing justice to your pretensions, and of demonstrating that you have been dishonest or simply deceived. Tell me then, unequivocally, what you have seen."

Continued on the next page.

Lescarbault then proceeded to show his equipment to Leverrier. This consisted of a small refractor (the typical, and very expensive, amateur instrument of the day), a pocket watch showing only hours and minutes and a seconds pendulum (the equivalent of our modern stop watch). All calculations had been made on a wooden board, the surface of which was cleared for new calculations with a small hand plane. Despite the modesty of the equipment Leverrier came away convinced the observations had been accurately made, and that the suspected planet had been observed. He congratulated Lescarbault on his discovery and named the new planet Vulcan. From Lescarbault's single observation, Leverrier obtained the following data:

Longitude of Ascending Node 12o 59'

Inclination of Orbit 12o 10'

Semi-major Axis (Earth=1) 0.143

Daily Heliocentric Motion 18o 16'

Period 19 days 17 hours

Mean Distance from Sun 13,082,000 miles

Apparent Diameter of Sun from Vulcan 3o 36'

Greatest Possible Elongation 8o

Leverrier's work was now ready for its final test: a second, predicted, observation. Astronomers at major observatories were alerted and anxiously awaited the great event. Alas, Vulcan failed to show up for its scheduled passage across the sun's disk.

After 127 years Lescarbault's observation remains unconfirmed. Numerous sightings of unexplained objects transiting the sun have been reported since 1860, but none of them appear to be consistent with an intra-Mercurial planet. Sightings of unexpected star-like objects in the immediate region of the sun during solar eclipses have been reported, notably by Watson and Swift in 1878, but these observation agree neither with theory nor with each other. Belief in Vulcan began to wane by 1880. It is possible that some of these sightings were transits of the nuclei of sun-grazing comets. Many comets which encounter the sun are never observed from earth because they both approach and recede from that part of the sky which is behind the sun from our viewpoint. This is evident from the fact that many comets have been observed during solar eclipses but are never seen otherwise. However there is no authenticated observation of the transit of a cometary nucleus across the sun's disk.

Leverrier maintained his belief in Vulcan for the rest of his life. Shortly before his death in 1877 he wrote: "There is, without doubt, in the neighborhood of Mercury, and between that planet and the sun, matter hitherto unknown. Does it consist of one, or several small planets, or of asteroids, or even of cosmic dust? Theory cannot decide this point."

Theory did decide the point, though not in a manner which Leverrier, in spite of his undisputed genius, could have conceived. The Theory of Relativity, first published in the early years of this century, has special meaning for the Vulcan problem. As with other planets, the orbit of Mercury is essentially a perfect ellipse. The direction in which this ellipse is tilted rotates slowly about the sun. The shape of this orbit, as well as the rate at which it rotates around the sun, is determined by the mass of the planet, the mass of the sun, the planet's distance from the sun, and by the perturbations caused by the other bodies of significant mass in the solar system. Astronomers of the late 19th century thought that they were aware of all these factors to a great degree of accuracy, and thus the positions of the planets could be predicted fairly precisely, well in advance.

This was true with one exception. This exception was Mercury, where the rate of advance for the perihelion could not be reconciled with the most careful predictions. According to Einstein, the presence of a strong gravitational field requires the addition of new terms to the equations describing space and time, which were unknown to Newton and the other founders of celestial mechanics. Mercury is the only planet whose orbit lies sufficiently close to a very massive body (the sun) for these new considerations to be measurable. The net effect is that the Newtonian formulas, when refined by the relativistic terms, predict an advance of Mercury's perihelion exactly equal to that observed over the centuries. In fact, this is one of the three classical tests of the theory of relativity.

Once again our knowledge of the solar system had been advanced by a man sitting at a table, working with only a pencil and paper! Nevertheless, the lure of such an appealing subject as an undiscovered planet, even within the orbit of Mercury, will probably never die out. It is possible, even probable, that there are very small bodies (or cinders!) revolving in the hellish intra-Mercurial region. Some of them are most certainly man-made. What is definite, however, is that they will never be observed from earth by optical means, whether in transit across the sun, during a total eclipse, or at elongation. The phenomenon of irradiation, which causes the Sun's bright disk to overlap any dark object transiting it by about one arc second all around, prevents any inter-Mercurial object smaller than 900 km diameter from exhibiting any visible disk during transit.

The case book for Vulcan is closed. Leverrier and Lescarbault are not to be criticized for their honest and scientific approach to a very serious problem. Though they did not live to see their theory disproven, they realized that they were working within what a future generation would call the margin of error. But their reasoning was sound. They looked where no one had looked before. They were not bound by the harness of conventional thinking. Theirs was the spirit of scientific discovery.

The Case of the Lonely Observer

by Bill Warren

(Author's Note: This article originally appeared in the July, '97 issue of the FRAC Observer. Its inclusion here is a reminder to Focal Point readers that ignorance has no expiration date.)

Sure is lonely out here. It's May 30th, and I'm waiting at the entrance to Cox Field in case anyone shows up for our scheduled deep-sky observing. The weather hasn't cooperated today: as late as 9:00 p.m. the sky was overcast and threatening to rain, but now, at 9:30, it's crystal clear. I brought along my 3-1/2" refractor—the one that worked fine until I fell down the stairs with it—and to pass the time I'm looking at double stars and Messiers.

It's getting dark now, the sky a gray shroud with diamonds scattered across it. Mizar A/B and Alcor are lovely, as always. Observing M13, the Great Cluster in Hercules, reminds me of how far I've come in four years.

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As a beginning stargazer, my observing technique was like Chevy Chase's sightseeing in "National Lampoon Vacation": find something worth seeing, take a quick peek at it, and hurry on to something else. In those early days, I pretty much took it for granted that all dim objects in the sky look alike.

In my 3-1/2" telescope, M13 was a fairly bright, raggedy-edged ball of light with no individual stars resolved. What I didn't understand back then was that a vast difference exists between looking at something in the sky and actually seeing it. I blamed my difficulties in observing deep-sky objects on my faulty vision and small telescope, not on my unwillingness to stay with objects long enough to see everything that careful observing might reveal.

I'd always heard that, like the telescope itself (but unlike photographic film), the human eye gathers but doesn't store light. So I didn't believe Art Russell and Rich Jakiel when they said that "The longer you look at an object, the more you see of it." Well, I was wrong and they were right, and I wasted a lot of valuable observing time by giving up early on faint objects if they were not instantly clear to me. My 3-1/2" 'scope started resolving globulars like M13 and M3 when I started giving them the attention they deserve, staying with them and using different eyepieces to find out which one gave me the best view.

Still...It's a quarter to eleven now, and the only sign of life I've seen out here is Mr. Cox's dog. Came up out of the darkness a few minutes ago and nosed me in the behind while I was bending over the eyepiece. Didn't scare me, though. In the dark, you'd think it was grass stains on my pants.

It's a good thing I had a pair of jumper cables in my truck, or I'd never have gotten my heart started again. A little Tide should clear up the other problem.

(Note: No one else showed up, so I had the entire night sky all to myself on the evening of the 30th. I spent half an hour with an old friend, the little globular cluster M80, and never resolved any of its stars. But this time, at least, it wasn't because I was in too big a hurry to see what I was looking at.

From the Prez's Desk:

In Star Trek II, The Wrath of Khan, Kirk's old beau said of her work on the Genesis Project "Can I cook; or can I cook?"" Well, the AAC cooked this summer (and not just because we had four months of temperatures over 90 degrees!)

FoGSPA, under the able co-ordination of Joanne Cirincionne, has made us a household name in the state parks around Georgia. Keith pulled the mirror on the 10" Cave and sent it out for recoating. Gil and Rich J. are working to upgrade the 24". Ralph B. has started to build the steps on the new warm-up shed - the only delay has been the inhumanely hot weather. And, despite the drought, the new grass is growing at VR. In defiance of Georgia's murky summer skies, Frank Marchese has kept up the AAC's reputation by acquiring 4 (or is it 5?) AL certificates in the last two months!

Tom B. and John L. efforts to combat Light Pollution have resulted in a letter writing campaign to Wal-Mart, in regards to the distribution center they are planning in Carroll County; attendance at several Council meetings to push for light pollution ordinances; a letter of commendation to AutoNation for their good lighting policies and adding information pages and links to the AAC website about light pollution. (Check them out, please.)

We now have AAC T-Shirts. A tasteful royal blue logo on a pale heather shirt. Only $10 for men's Small to Large; $12 for XL, XXL and XXXXL. Also 6 women's mediums with a scoop neck. They will be on sale for the first time at the Bradley Open House on Sept 8 and at the next General Meeting. The revised AAC brochure is ready to print and it can be found on the AAC website. Peter has also created a test survey (he is surveying whether or not a website survey will work). It will enable us to poll member & non-member and get almost instant feedback. Check it out and give us YOUR opinions.

Alex has lined up a really interesting speaker for our October Meeting - please note that the meeting will be moved up a week to October 13th. With better weather ahead, Mark Banks is starting to line up his fall and winter Sidewalk Astronomy dates. I would encourage all members to try to help out at least once every year. Newcomers, it is a great way to meet the other members of the AAC, feel like a genius, and be home in bed by 11:00 p.m. (usually) without eating into your serious weekend observing time. See you in September!

Sharon

Close Encounters of the Animal Kind

by Tom Faber

Last fall Kat and I went on a two-week road trip out west. We visited a number of national parks including the Petrified Forest, Grand Canyon, Bryce Canyon, Zion, White Sands, Carlsbad Caverns, and Guadalupe. We also stopped at several astronomy and space related sites including the Johnson Space Center, the VLA, Meteor Crater, and McDonald Observatory. At one of our stops in the Petrified Forest, Kat threw some trash into a trash can. Immediately a crow swooped down, landed on the can and went "Caw, Caw", apparently expecting a hand out. Ever since this encounter Kat has despised the constellation Corvus.

On our way back we camped one night at Davis Mountains State Park in Texas. This is very near the site of the Texas Star Party, and a few miles from McDonald Observatory. After it got dark the skies were fantastic! The Milky Way had a granular appearence to it, not the

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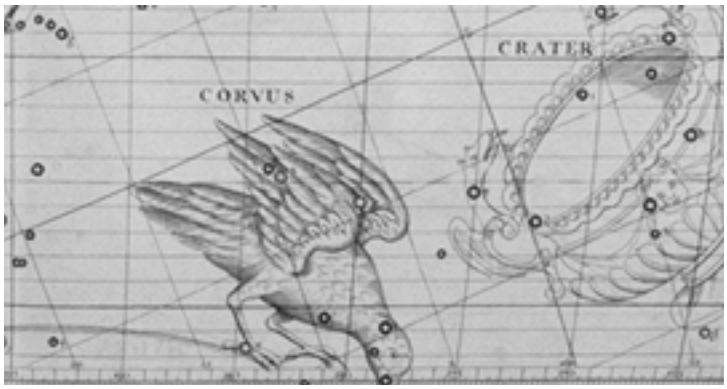

smooth cloudy look we usually see in the southeast. A short while after we sat down to do some binocular observing we heard a noise on the ground in front of us. I shined the red flashlight toward it and we saw a raccoon about six feet away. When it saw the light it lumbered off into the darkness. About half an hour later we heard another noise off to our right. Kat said she thought it was a skunk. We sat very still and it finally moved farther away. I slowly got up and shined the red flashlight toward it. I could see two glowing eyes that bobbed up and down, then it started to move closer. It stopped and bobbed its head up and down again then moved closer. It seemed curious about the red light. Enough of this... I turned on a white flashlight. It was definitely a skunk. When it saw the white light, it turned and headed off. The skies clouded over and it got very windy a short while later, so that was the end of the observing. We had no more animal encounters that night, but we learned that skunks are attracted to red light; or at least that one was!

A Visit to Mauna Kea

By Larry Phillips

When my wife and I began discussing a trip to Hawaii a few months ago, I was determined that the visit would include going to the summit of Mauna Kea. I have always been attracted to extremes of any sort, and the mountain's reputation as the *best* observing site in the world, with the *biggest* telescopes, was an irresistible draw.

In pursuit of the dream, we arrived in Honolulu August 7, and immediately left the tourists behind and flew aver to Hilo, on the eastern side of the big island. Hilo is the closest city to Mauna Kea, but getting to the mountain turned out to be a little problematic. The road west from Hilo (the "Saddle Road") is so desolate that rental car companies require customers to sign an agreement that they will not drive on it. Beyond that, the road from the Saddle Road to the summit requires a 4-wheel drive, because of its steepness and the fact that much of it is unpaved. Fortunately, there is a company in Hilo that rents 4-wheel drive jeeps (with explicit permission to drive them to the top). I debated about the price ($110), but only for a few seconds.

We set out on the Saddle Road Saturday morning – Saturday and Sunday are the only days when guided tours are given. Within a few miles the terrain changes from rain forest to a vast lava field with hardly anything living in sight. After about 30 miles, the unmarked summit road turns off and begins the ascent. At the 9,000 foot level, there is a visitor's center, and they recommend staying there for at least an hour to get adjusted to the altitude. During that time a very knowledgeable guide gave a talk about the observatories and answered questions. One thing he mentioned is that Mauna Kea is the *tallest* mountain in the world; from its base on the ocean floor to the peak is 56,000 feet (the *altitude* is 14,000). He also said that only one night in six is clouded out.

At 2:00PM our caravan of 5 jeeps set out for the remaining 8 miles to the top. It's slow going, there being no guard rails and part of the drive was through a cloud layer with low visibility. It's hard to imagine how they got all that equipment up this road.

At the summit was the sight I had been waiting for – all those observatories, and just like the pictures I'd seen! I counted 11 observatories, but I'm not sure if that's the correct number. The temperature was in the forties with a strong wind, so we were glad we brought warm clothes. Although there was no snow, in the winter people do go skiing in the summit area. To my pleasant surprise, the tour guide took us inside the Keck I observatory. It's a huge piece of machinery, but I confess that without the guide I couldn't have determined which end was which. He told us that time on the Keck runs $45,000 per night, or about $1 per second.

We cut the stay short and left after about an hour, since both my wife and I were feeling a little ill from the altitude. In any case, it would not have been possible to stay and see the night sky from there, since no headlights are allowed after sunset. (however, you could probably bring a telescope and camp on the summit).

All in all this was one of the more memorable experiences of my life, and I wanted to write about it the hope that others will include it in a visit to the islands.

Astronomical League Stuff

By Keith Burns

There are no new names to add to the Astronomical League observing list this month, but your name can be put on that list. All you have to do is complete the requirements of one of the AL observing programs. There are 21 different observing programs available for you to do. Anything from observing the sun to logging the Messier objects. You can also observe the moon. Some of the programs require the use of binoculars instead of a telescope. So if you don't have a telescope, you can still do one of the programs with a standard pair of 7X35 binoculars. If you want information on the programs available, contact me by calling(home 770-427-1475) or email me(at Keith_B@bellsouth.net).You can also ask any club member wearing one of the observing award pins. They can give you some info on the perticular observing program they have completed. Remember that as a member of the AAC you also have a membership in the Astronomical League.

The Faint Fuzzy Forum of the AAC

By Richard Jakiel

As the Autumnal Equinox draws near, I for one will be glad to see this summer draw to a close. I have lived in Hotlanta for better than 14 years and this has been by far the *worse* summer observing season in memory! A drought-stricken summer has lead to an ever persisitant layer of smog covering most of Northern Georgia. Thankfully, the weather patterns are reverting back to normal and with the approach of Fall means cooler, shorter days and long, crisp nights. In anticaption of the return of clear skies, several major deep-sky events have been planned.

September 22-24, Annual *Zombie* Party at CEWC

Once again its time for the return of the "Zombie Party", a popular event for every level of deep-sky observer. See the article below for more information.

September 30th, Woodruff BSC

Take a trip to the North Georgia Mountains and enjoy some of the darkest skies in the Southeast. The skies here are far better than those found at Villa Rica or CEWC and an easy two-hour drive from downtown Atlanta. Camping is allowed at this site and porta-potties will be located on the far end of the field. Come check out what may become the AAC's newest observatory. Directions and the camp rules may be found the AAC WebPages.

October 21st, Annual Picnic at the Barber Observatory near Villa Rica

If you haven't been to the club observatory lately, it's a good time to check things out. Lots of good eats and drink (this is usually a potluck dinner) plus deep-sky observing with the club's 20-inch and 10-inch scopes. With a little luck, the largest renovations will be completed by then – electrical power to the new Po-Shed and a newly installed computer network (Then again, it could be the start of a major work project!). Perhaps later in the evening will there will be a barking spider hunt. Stay tuned for more info.

October 26 –29th, Chiefland Star-Party

Several times a year, an informal star-party gathers at the Chiefland Astronomy village, Florida. This is one of my favorite star parties to attend, with lots of interesting people, *large* scopes and some of the best skies in the Southeast (can we say +7th magnitude skies?). I almost forgot the huge potluck dinner – a massive feast of every kind of food imaginable. The price of admission is almost non-existent – a mere 5 dollars a night. And being so close to Halloween – it may be the "Night of the Living Dob" or the "Revenge of the Lunatics" (shudders in fear). Woo, now that's a scary thought.

ZOMBIE PARTY SEPT. 22 and 23

By Philip Sacco

It is that time of year again for the annual 'Zombie Party'. From my closest recollect this one should be #5. The date is set for Sept. 22 and 23, 2000, and it will be hosted at the Charlie Elliott Wildlife Area. Here are the particulars:

This is a camping event, and unless you have an 'observing tent', all camping will be done at the camping area on Murder Creek Road on the CEWMA site. Observing will be allowed at the observing field and the camping area. The Activities Bldg offers us 24 hour facilities, restrooms, covered picnic tables, and exterior Power. The parking area can be used for setup of power hungry telescopes, and there are soda machines available. These 'bennies' make it comfortable for newcomers to enjoy astronomy. The hard core are welcome to use the observing field near the Visitor Center. Please remember to sign in when using the observing field. There is a mailbox located on the left hand side of the road just as you enter the observing field for this purpose. You will find the log in sheets and pen inside the mailbox as well as informative info on the Elliott Area

We request that you PREREGISTER for this event. Cost is $5 @ night per person if you register before Sept.15th. Children under 12 are free. Please contact Peter Macumber to register, 770-941-4640. Send your check to 1057 Trestle Drive, Austell, Ga., 30106 made payable to the Atlanta Astronomy Club. Registration after Sept 15th will be on site, and there will be an additional $10 fee for the event to register late, or on site. Monies will go to provide coffee, donuts and general eats. See below. **Volunteers will be admitted for free**. You must notify Rich Jakiel or Philip Sacco of your desire to **Volunteer**. We need volunteers to man the clubs 24", train members on its use Saturday night, Hawkers to sell club wares, Tenders for the coffee and goodies tables, and Presentors for the Public Orientation on Saturday night. Those positions left unfilled will mean the **ELIMINATION** of those activities. This is **YOUR** club, and your club function. Come, be part of the fun and help make it Happen . . .!

All activities will take place at the Activities Bldg. South of the Camping area where the Chapter has been holding it's meetings. We plan on the facility being open to provide coffee and hot chocolate and munchies both nights. Any remaining unused money will be spit with the Elliott areas chapter as a donation.

Friday night will have no scheduled activities other than an impromptu 'Celestial Mythology Walk and Talk' at the Camping area sometime around midnight. Observing from the observing field and the camp area will be expected to go the night thru.

Saturday the schedule looks like this: All attendees are welcome to use the firing range for handguns and rifles in the morning and afternoon if you like. Fishing is also available in any of the many lakes on site. The hiking trails offer plenty of opportunity to bird watch and enjoy the weather. To meet the desires of the Astronomy-Minded, we will have 3 guest speakers in the afternoon in the Activities Bldg. The talks will begin between 11am-12pm. The schedule will be posted at the event.

This will be followed at 4pm with a 'Swap Meet' outside the Activities Bldg at the covered picnic tables. Starting at 5pm we are encouraging everyone to bring a covered dish to the Activities Bldg for a 'Mixer and Pot Luck Diner'. Dinner will be served from 5 til about 7pm.

7pm At the Observing Field will be hosted a training session on the clubs 24" Techtron. Public Viewing with the scope will be limited to Saturday night, 9-11pm, after which attendants and club members may use the scope for their purposes. Please be advised, this is subject to change due to the number of club members being trained on the scope this evening.

7:30 pm at the Activities Bldg will be the Chapter meeting, and public Orientation. There will be a brief intro to Mythology, and general

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questions and answers for the public and guests. We will have drawings for at least one door prize, and you will have to be present to win. We plan to have available for purchase: 'The Atlas of the Moon' by Antonin Rukl, Observers Log Books, club coffee mugs and observing jackets. If we get lucky, we may even have available the first of the clubs official AAC T-shirts.

There will be a mythology talk on the field for the public in the camp area around midnight. We ask that all club members remember their nametags, and if you haven't gotten yours yet, we should have yours at the event, or we will make you one. This event is sponsored to have a good time, and help recruit new members for the clubs chapter of astronomy at the Elliott Area. I hope to see you all there for yet another successful 'Zombie Party'! Let's give it our best, and see how many new faces we can induct into the roles of the "Zombies"!

Calendar

September 15th - General Meeting at Emory
8PM Speaker Lenny Abbey.

September 22nd - 23rd Zombie Party CEWMA
Open House Sept. 23rd. Training 24 inch scope TBA.

September 30th-Woodrift Boy Scout Camp
Deep sky session at Bee field.

October 6th - Open House "Astronomy and Poetic Impulse"
Cambell Hall at ASC. 7:30PM.

October 13th - General Meeting at Emory University 8PM
Speaker Dr. William Sheehan.

October 21st - Annual Picnic at Villa Rica.

October 27th-29th - Chiefland, Fla. Special Deep-sky event.
October 28th - Mentone, Ala. - Alternative Deep-sky event.

October 28th-CEWMA Chapter Meeting.

November 1st- Gaines Auditorium at ASC.
Speaker Timothy Ferris 7PM.

November 4th-Walter Barber Observatory Open House.

November 10th-Open House"Sculpting the Sky" 7:30PM
Bradley Observatory at ASC. Speaker Amy Lovell.

November 25th-Deep Sky Session Woodrift BSC.

Joint Star Party Mentone, Alabama

By Keith Burns

The Atlanta Astronomy Club/ Von Braun Astronomical Society Joint star party becomes a spring and fall event. This event usually takes place in May of each year but we have decided to try to do it twice a year. The observing location has changed to. Since we last held the event, the town of Mentone is now the new location. It's located west of Summerville, Georgia and only a few miles inside of the Alabama state line. Thanks to AAC member Roger Dowiat for allowing us use of the site.

The observing field is a grassy hilltop with good horizons and dark skies. It's located on top of Lookout Mountain. It is 1900 feet above sea level. Unlike the previous site, this location is only a short distance off the main road. If you have any questions or want more information, please phone me (at 770-427-1475) or email me (at Keith_B@bellsouth.net). Watch for The October issue of the focal point, AAC website, and AAC listserv for more information.

October 28th is the date of the star party. The Chiefland Star party is scheduled for the same weekend. If you don't want to(or can't) drive to Florida, this is the star party for you. The distance is exactly 88 miles from my house in West Cobb. There is no charge for the event either. There will be no speakers but plenty of an observing. You can either tent camp or sleep in your vehicle. Come on out and hang out with the folks of the Von Braun Astronomy Club for the night.

Timothy Ferris Announcement

Mark this date on your calendar. Wednesday, November 1, 2000 at 7 PM. Timothy Ferris, author of The Whole Shebang, Coming of Age in the Milky Way and many other books and the creator of the PBS series, Life in the Universe, will speak in Gaines Auditorium at Agnes Scott College.

Amatuer Telescope Makers

Since the temporary loss of their home at Bradley, the ATMers meet randomly but often. Watch the AACLIST to find out more from Tracy or Skip. They have been meeting at Skip Cook's House. Skip is listed in the committee section of the Focal Point on page 7. You can also email Tracy at tracywilson@alltel.net.

Tennessee Star Party October 20-22

By Rocky Alvey

The Barnard-Seyfert Astronomical Society in Nashville Tennessee, is hosting an astronomical event in October. We have secured a large field with cabins at Fall Creek Falls State Park. This place has fantastic scenery and wonderful dark sky. Our camp can accommodate about 200 people and at least that many telescopes. We will have great speakers and fellowship. For more information please visit this link. http://www.bsasnashville.com/directory.html We hope to hear from you!

The Aurora Morphology

By Jan Curtis

P.O. Box 83482

Fairbanks, Alaska 99708

For anyone who has witnessed one of nature's greatest shows, the northern lights, one is compelled to say that it is about of the most exciting things they have every seen. Besides it's rarity in latitudes south of 50°N, when it is seen it never looks the same.

Aurora's brightness can vary from the brightness of the Milky Way to an illumination bright enough to cast shadows! (FIG 1) Its structure can be a diffuse homogeneous glow (FIG 2) to one with extensive sharp boundaries and complex internal structures known as rays (FIG 3). Sometimes it can remain in one location for hours or zip across the sky in seconds. Its color, which is mostly green (FIG 4), can have red bottoms (FIG 5) or tops (FIG 6) or be entirely pink or red (FIG 7), as was the case on April 6th and 7th this year when the largest solar storm to hit the earth since 1989 occurred. Purple or blue aurora (FIG 8) results from the tops of the displays that are lit by the sun (below the horizon) or by bright moonlight. Unlike clouds, most stars will be visible through all but the brightest aurora.

While aurora is most frequent around local midnight, it can be viewed when the sun is 8 or 9 degrees below the horizon. Generally, aurora start as a uniform smooth arc from horizon to horizon and as the night progresses it rises and forms a discrete band that is irregular and filled with slightly converging brighter areas (rays) (FIG 9). As the display brightens, these bands will begin to fold on to themselves and form a curtain or drapery formation. If the display continues to intensity, the rays will converge to a vanishing point at the magnetic zenith and form a corona (FIG 10). These displays are pretty rare and a definite trophy to the patient photographer. After the display dies down, a general glow or patchiness (FIG 11) will persist across most of the sky and a strobbing or pulsing effect between 0.1 sec to 30 sec will be seen. The display can always repeat itself over and over during the remainder of the night, so don't quit looking. Evening aurora move from east to west and reverse direction after midnight.

During extremely bright displays, snow will appear completely green or red and some claim to actually hear the lights as a crackle or hissing. Since the lowest aurora is 60 miles high where there is no air for sound to travel, what might explain this sound has more to do with electrical static discharge on the ground induced by the aurora. I have viewed 100's of hours under the lights without hearing anything unusual. However, as the lights dance across the sky, my mind puts these motions into music. It's like watching fireworks from a distance and hearing the boom before the sound reaches you. It's an anticipation of sorts. My eyes are telling me that the aurora should be producing more than just a light show.

Figure one to right. Can't sleep? NO WONDER! They say its supposed to be dark all day long in Alaska. How can anyone sleep with the majesty of the aurora lighting up the sky. This photo was shot looking to the southeast over the photographer's house. Early January 1998 near Fairbanks, AK with ASA 400, 35mm, f/1.4, exp time=15s. This photo was taken during a quiet period of aurora activity. Imagine what an active period must be like!

Figure Two at rightside of page. Diffuse aurora glow with lenticular altocumulus clouds.

Figure Ten top of page. During a major aurora storm on 18-19 Oct 1998 and again on 7-8 Nov 1998, I had the opportunity to catch the rare red aurora and full corona over Fairbanks. Exposure for the corona image was made at 2 to 4 seconds. The camera settings were: 35 mm lens @ f1.4. I used the Kodak negative print film PJM-2 (Ektapress, multi-speed film, developed at ASA 640). The Great Convergence of rays; also known as the Multiple colored corona!!! Presented to the Prime Minister of Japan in May 1999. Picture taken on11 Nov 1998.

Figure Five at bottom of page. Timing is everything. This brief storm lasted only 8 minutes on 6 December at 9PM. A few minutes later looking over northern horizon bright B-type aurora with cascading rays dominate sky.

Figure Six to right. Just after midnight (local time) on 7 September 1999, a major aurora storm was captured on film. All exposures were 12 seconds at f/2 using 35mm lens and Kodak's Ektapress 640 negative (print) film. Red and green rays with Jupiter just above center of shack & Saturn to its left.

Figure Eleven to left. My preference for aurora film is definitely Kodak's Ektapress 800 print (negative) film. To the left is one of the pictures from the newest roll of film taken in November and December 1999. I like activity overhead as well as on the horizon. Here is a complex formation of lanes. Take on 5 December at 8:35PM, f/2 @ 15 sec.

Figure Seven to right.

On 23-24 February, 2000, using Fuji's 800 NHGII print film, 35 mm lens at f/2.0 (exposure between 5-12 seconds), I captured an two unusual aurora storms. The first on the 23rd contained nice reds (which is rare at these high latitudes), and on the 24th, a beautiful multi-rayed band and sweeping curtain. I have included higher resolution scanned images for those with faster (wider bandwidths) internet connections. Salmon pink glow.

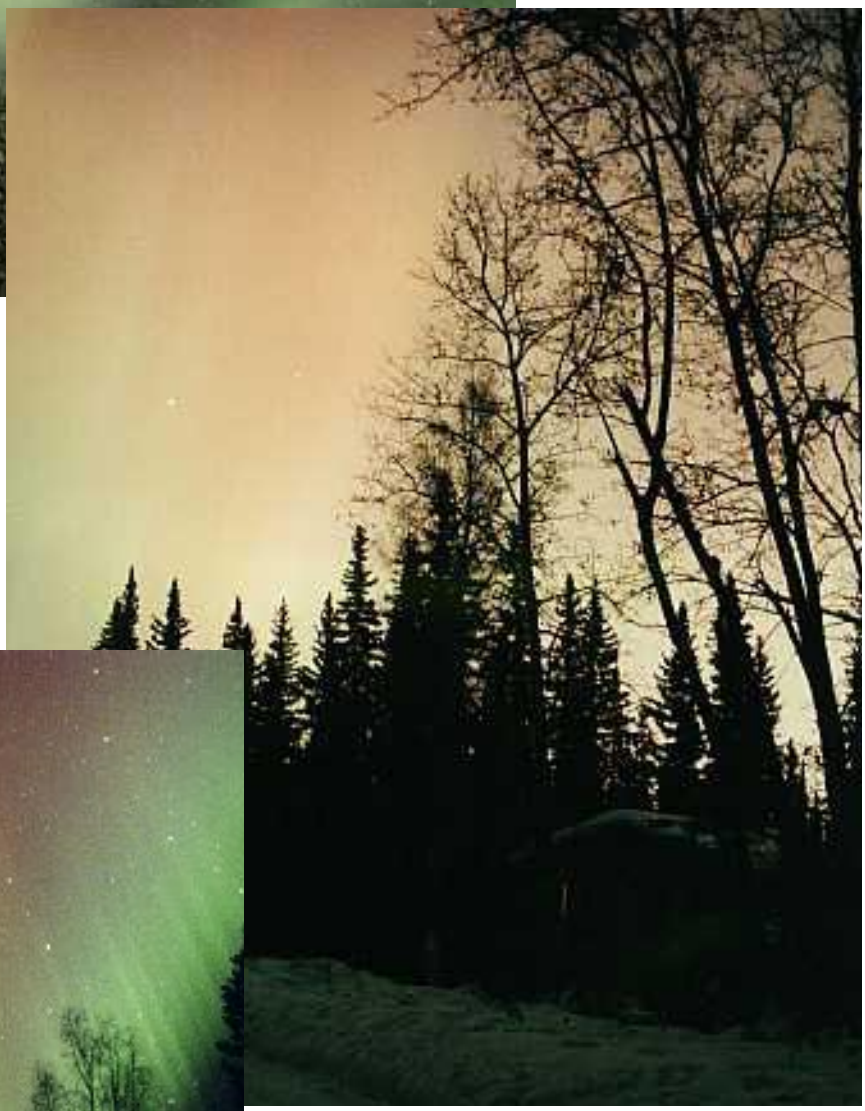

Figure Eight to left. On 6 March 1999, the first significant aurora storm to occur this winter was captured during the time a nearly full moon was rising. Exposures were 10 to 15 seconds at f/2.0, using my 35 mm lens and Kodak's PJM-2 (Ektapress, multi-speed film, developed at ASA 640). Star images are crisper by stopping down one f-stop from maximum aperture openning. Picture of multi-colored (green bottom, violet top) rays.

Pictured above is Jan Curtis.

Figure Four to the upper left. On 23-24 February, 2000, using Fuji's 800 NHGII print film, 35 mm lens at f/2.0 (exposure between 5-12 seconds), I captured an two unusual aurora storms. The first on the 23rd contained nice reds (which is rare at these high latitudes), and on the 24th, a beautiful multi-rayed band and sweeping curtain. Pictured is a sweeping drape.

Figure Nine to the right. Just after midnight (local time) on 7 September 1999, a major aurora storm was captured on film. All exposures were 12 seconds at f/2 using 35mm lens and Kodak's Ektapress 640 negative (print) film. Rays extending towards the zenith.

September Meeting

The meeting will be held at White Hall on the Emory University Campus. The meeting starts at 8PM. Our speaker for this month's meeting (Sep. 15th) is the Atlanta Astronomy Club's own Leonard Abbey.

Many of you may remember his wonderful talk a few years ago, when he filled in at a moment's notice for Richard Berry (who was stuck in flooded Oregon). We welcome Lenny back with his latest talk, "Telescopes I Wish I Had Known, The Sequel".

Lenny has been a member of the Atlanta Astronomy Club for almost 50 years. In his younger days he was a very active and productive observer. A long-time member of the Association of Lunar and Planetary Observers (ALPO), he was the first recorder of ALPO's Uranus-Neptune Section, which later evolved into the Remote Planets Section. He was also the first Assistant Recorder of ALPO's Mars Section. In addition, Lenny has participated in observing projects for NASA, the Smithsonian Astrophysical Observatory, and the Harvard College Observatory. In recognition of his contributions, Lenny was elected a Fellow of the Royal Astronomical Society in 1970.

Looking ahead, our meeting in October will be on the second Friday, October 13. Our very special guest will be noted astronomical author Dr. William Sheehan, who will be visiting us from Minneapolis. Among his highly acclaimed books are "Planets and Perception" (about the Mars observations of the late 19th century) and "A Fire Within" (about E.E. Barnard). For November, we are hoping to have planetary nebula specialist Jay McNeil as our speaker, but that has not yet been confirmed. I am always open to suggestions, so if you have any particular topics or speakers you would like to hear, please let me know.

-Alex Langoussis

Pictures on left side of page taken on Nov. 7, 1998. If aurora is visible at twilight, then a great display is certain.

All images of the aurora included in this focal point are used with kind permission of Jan Curtis. Images copyrighted 1997-2000 by Jan Curtis.

For more information about these aurora images, visit his website located at http://climate.gi.alaska.edu/Curtis/aurora/aurora.html. You can also contact him via email at Jcurtis@gi.alaska.edu His mailing address is listed on page 7 of this months Focal Point.

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Did you know that there are two versions of the focal point available? One is the standard 8 page black and white one that is mailed to members. The other version is the web version. It is10 to 15 pages long. It's also in color and includes pictures and an extra article or two.

The Focal Point is available in color online in PDF format. The free Adobe(R) Reader allows you to view, navigate, and print PDF files across all major computing platforms.

Visit **NightSky.Org/aac** on the web. In a private sub-web, the past year of Focal Points can be found. Check it out. If it works for you, send me an e-mail and I will stop sending you a copy snail-mail. It will also save the club a dollar. The Focal-Point web can be entered by using the Username of **AAC** and a password of **mizar**. These names a case sensitive! Type AAC in capitals, type mizar in lower case.

Peter

Focal Point Deadline

I'm looking for articles, pictures, and drawings on anything astronomy related. Perhaps you have taken a trip somewhere and did something astronomy related while there. Tell the rest of us about it.

You can email it to me or send it to me. My home address is Keith Burns 3740 Burnt Hickory Road Marietta, Georgia 30064. Email address is Keith_B@bellsouth.net.

I'm especially looking for stuff on the late Comet Linear S4 or any aurora pictures you may have taken in the last year. The **deadline** for the **October issue** is **September 29th**.

AAC Membership & Magazine

You are sent a membership renewal two months before your membership expires. Your magazine renewals are sent to you by the publisher. Magazine renewals must be paid by the club. Remember to send renewals to the club with a check payable to the club. S&T is $30. Astronomy is $29. Club membership is $25 or $10 for a student.

The Focal Point

Newsletter of The Atlanta Astronomy Club, Inc.

FIRST CLASS

FROM:
Keith Burns Email: Keith_b@bellsouth.net
3740 Burnt Hickory Road
Marietta, Georgia 30064

We're here to help! Here's how how to reach us:

Atlanta Astronomy Club
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3595 Canton Road A9
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The Atlanta Astronomy Club Inc., the South's largest and oldest astronomical society, meets at 8:00 p.m. on the third Friday of each month at Emory University's White Hall or occasionally at other locations (check the hot line for details). Membership is open to all. Annual dues are $25 ($10 for students). Discounted subscriptions to Astronomy, and Sky & Telescope magazines are available.

Hot Line: Timely information on the night sky and astronomy in the Atlanta area is available on a twenty-four hour basis on the

Atlanta Astronomy Club hot line: **770-621-2661**.

Internet Home Page: **http://www.AtlantaAstronomy.Org**

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To tell me what a wonderful job I am doing, send messages to: **LAbbey@mindspring.com**