

September, 2010
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The IAS News & Views



**The September General Meeting, September 11, 2010
8:00 PM
Goethe Link Observatory**

Cosmic Ray Experiments in the Stratosphere

Howard L. Brooks
Department of Physics and Astronomy
DePauw University
Greencastle, Indiana

The Balloon Assisted Stratospheric Experiments (BASE) program at DePauw University aims to conduct high altitude physics experiments carried aloft by helium filled latex balloons. Since our first flight in 2006, we have often measured cosmic activity in the atmosphere using Geiger counters. The data collected by Geiger counters from flights have shown an increase of counts per minute of energetic particles as the altitude increases, and a decrease of count rate after reaching a critical altitude, known as the Pfozter Maximum[1]. This result confirms the mechanism of the formation of energetic particles produced by cosmic rays. We have also flown the Geiger counters in coincidence circuitry to locate the production region for the most energetic particles. Over the last several months, we have covered the counters with different thicknesses of lead and have hypothesized that lead shielding will decrease the count rate. The data collected on the ground have shown a decrease of count rate due to the shielding. However, the data collected in atmospheric runs have shown an increase in count rate with the presence of lead shield. We suspect that the cosmic rays and the particles produced by cosmic rays in the stratosphere are sufficiently energetic to produce more particles when they hit the lead shield. [2] Also, the geometry of the lead shield around the Geiger counter affects the number of counts determined by the volume enclosed. I will discuss the next phase of this investigation that will begin this fall.

[1] Gaisser, Thomas K., **Cosmic Rays and Particle Physics**, p. 44, Cambridge University Press, 1990.

[2] Rossi, Bruno Benedetto. **High-energy Particles**. New York: Prentice-Hall, 1952.

Dr. Brooks graduated Summa Cum Laude with honors in physics from William Jewell College in 1977. He completed his M.S. (1979) and Ph.D. (1981) degrees in physics at the University of Missouri-Rolla. His research there investigated the interaction of low energy electron swarms with gas mixtures containing iodine and mercuric bromide. He joined the faculty at DePauw in 1981.

From 1986 until 1994, Dr. Brooks conducted research with engineers in the Test Laboratory at NASA's Marshall Space Flight Center in Huntsville, Alabama. In the summers of 1986 and 1987 he was a NASA/ASEE Summer Faculty Fellow. The remaining years, he worked under unsolicited grants dealing with the optical analysis of data collected during crystal growth experiments conducted onboard Spacelab.

In subsequent years, Dr. Brooks has supervised student research projects investigating the flight of various objects. Students in the Science Research Fellows program have built simple machines to throw boomerangs and kick footballs. , His current research is with the "[Balloon Assisted Stratospheric Experiments \(BASE\)](#)" program, which involves DePauw students and students from area K-12 schools in designing, building, and flying experiments into the stratosphere.

Throughout his career at DePauw, he has been active in the "[Indiana Section of the American Association of Physics Teachers](#)." He also serves as the Science Review Committee chair for the West Central Indiana Regional Science and Engineering Fair. DePauw has served as host for five Regional Fairs and the 2006 Hoosier Science and Engineering Fair (the state science fair). He is currently serving on the board of the "[Science Education Foundation of Indiana](#)".

IAS NEWS

The Bulletin

The contest for a new name for the Bulletin was won by Betsy Brown. The new name is IAS News & Views. Thanks to all who participated in the selection of a new name.

The Editor

IAS Calendar of Events for August

September 10-12 Campout at the Link
September 11 - General Meeting at Link Observatory
September 14- Board Meeting
September 18 NAG at McCloud

Observing Activities

Activities for September:

Link Observatory

September 10-12 Campout at the Link. The gates will open at 5pm on Friday.

September 11 General Meeting

McCloud Activities–

NAG –September 18

We are able to go to the Link, Prairie Grass Observatories, and McCloud Nature Park at non scheduled times if they do not conflict with reserved activities:

For those interested in going to The Link Observatories for observing call John Shepherd at 1 317-862-3442.

For those interested in going to McCloud to observe, please call the park office 765 676 5437 before 4PM on the day you want to go out. They will give you permission to be there at night and make arrangements to cut off the lights.

For those interested in going to Prairie Grass Observatories for observing call Hoppe at 1-765-296-2753.

Indiana Family Star Party A great Success

We had good weather and good participation. The party has grown from 75 to over 400 participants. Thanks to everyone who helped with the registration.

Jeff

Nebraska Star Party

Nebraska Star Party 17, August 8-13

“Got Milky Way?” was the theme – they do!

I forgot how dark the sky can be - M31 & M13 are *really* naked eye as is the Double Cluster - the Milky Way is magnificent, each arm clearly defined; I saw many planetary nebulae using a 21 Ethos and M51 in great detail using a 13 Ethos. Saturday and Sunday evenings were said to be some of the best observing ever albeit a slight wind, there were a few who got there even earlier and said those evenings were good too. Monday the wind picked up and clouds brought light rain that evening - I didn't setup the 20” Obsession until Tuesday evening. Tuesday started the hot! - 102 on the thermometer in the car as I headed to the local facilities for a shower and ice. I camped beside the lake below some big cottonwood trees but used battery powered fans to keep comfortable. The hosts provided that evening's dinner with a „Chuck Wagon” theme and every evening's Door Prizes (no luck this year). Toward 11 clouds rolled in and brought light rain later so we gathered under tarps, tents and shelters for fellowship and to watch the stunning lightning shows, there was a little observing after the rain. Wednesday was pretty nice early but hot and windy later – it's the traditional day for vendors, speakers and pizza at the local high school although there are slated activities most every day somewhere in camp, town or at the river (rafting, canoes, tubing, etc.). I treated myself to dinner at a local restaurant after visiting the local library to cast my vote for renaming of the Bulletin. Evening was good observing for the first half then clouds rolled in and out – I sketched constellations and asterisms, used binoculars and enjoyed the Zodiacal Lights – I turned in once M42 was high enough to observe. Thursday was about the same, hot and windy during the day and by around 3AM clouds and some rain; oh, did I mention mosquitoes? As I uncovered the equipment that evening they drove me off the field for a few hours – I used a newly purchased hooded observing vest that helped the much of the week (they too have had a lot of rain this year). As usual the best evening for observing was my last – Friday was crystal clear, no wind and virtually no mosquitoes – observe almost all night sleep 2 hours and pack up to come home. Just goes to show – got to put in some extra effort for great observing.

Submitted by John Molt

Other Observing Activities

The Kirkwood Observatory Solar Telescope is open on the "First Saturday" of each month from 1-3 PM. Viewers may even be able to see a solar prominence or two weather permitting. Updated weather conditions and closings will be posted at the Kirkwood Observatory Hotline at (812) 855-7736, and at the Observatory webpage, <http://www.astro.indiana.edu/kirkwood.shtml>.

Monthly openings of the solar telescope are planned for the first Saturday of each monthly during our 2010 observing season. And if you want to follow the Sun in between our monthly Solar Telescope openings, the website www.spaceweather.com provides daily updates.

IU Kirkwood Observatory

Kirkwood Observatory on the IU campus will be open each Wednesday evening through the summer, weather permitting! Join us for a night of observing the night sky with the Kirkwood 12" refractor. Please visit our schedule at <http://www.astro.indiana.edu/kirkwood.shtml>, for a list of dates and times. For updated weather conditions and closings, please call the Kirkwood Observatory Hotline at (812) 855-7736.

The IU Astronomy Department has an electronic bulletin to let people know about local astronomy activities and events. If you would like to subscribe, send an email to astdept@indiana.edu and we'll put you on the distribution list. Information about activities and events to be included in the e-bulletin should be sent to catyp@astro.indiana.edu.

**New Astronomer's Group Meeting
McCloud Nature Park
Saturday September 18, 7:30 PM**

Learning the September Night Sky

Phil Dimpelfeld

THE NAG MEETING WILL BE HELD - RAIN OR SHINE.

The purpose and intent of the NAG is to introduce newcomers to the wonders of the night sky. All types of observing will be discussed including naked eye, binocular and telescope.

If the weather cooperates, IAS members will have telescopes set up and attendees will have an opportunity to view some of the night sky objects following the meeting.

The night sky can be an intimidating place. With a little help everyone can enjoy the celestial beauty that we have all taken for granted our whole lives. From the constellations to the deep

sky; with the naked eye or with a telescope, there is something for everyone to enjoy. Weather permitting, there will be an observing session using IAS member's telescopes and binoculars following the meeting.

We need IAS members to be ambassadors and meet the public and show our hobby.

Objectives:

Learn how to:

- Find the major planets
- Identify the major guide stars
- Identify the summer constellations
- Find the International Space Station
- Use a Star Wheel & Star Chart
- Find Deep Sky Objects, such as
 - Double Stars
 - Open Clusters
 - Globular Clusters
 - Nebulae
 - Galaxies
- Use a telescope (weather permitting)

UP Coming Star Parties

Heart of America Star Party - September 2-9. Last year, they had it scheduled on top of TLSP, but this year it's in September. According to Mile Wolford: These folks, and this club, will make you drool with what they have accomplished. They own their own property --- WITH electric for on-site camping, and last year, they built a nice pole building on site. You should go! Pre-registration must be received by August 5th OR cutoff is at 200 people.

Astrofest Kankakee IL September 10-12

www.chicagoastro.org

Black Forest Star Party PA September 10-12

<http://www.bfsp.org/starparty/>

Prairie Skies Star Party Kankakee Illinois September 30-Oct 3

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

Okie-Tex Star Party – October 2-10 This is reported as one of the darkest sites in the US. It is a great deep sky event.

Twin Lakes Star Party October 2-10 This is a great party very close to home

www.wkaa.net

Chiefland Fall Star Party November 1-7

If you know of events coming up let me know and I will get them in the Bulletin

Stargazer

Neptune Discovered One Neptunian Year Ago

Can you believe it's been nearly a year since the planet Neptune was discovered? My how the time flies. OK, so it's been 164 Earth years, but it's but only been one Neptunian year.

When Neptune was discovered in 1846, it was located just inside the western border of the constellation Aquarius. Now after making one orbit around the Sun -- one Neptunian year -- it's back near where it was when discovered.

Long-time readers of this column with exceptional memories -- Hello, anyone out there? -- might recall reading about Neptune's discovery in a 1993 Stargazer. It's an interesting story worth retelling.

If planets could talk, surely Neptune was shouting out, "Will someone please discover me?" Yet, given the many missed opportunities it seemed no one wanted to.

In 1781, Uranus was discovered by astronomer William Herschel from his home observatory in Bath, England. Over the following years, studies of Uranus' orbit suggested the existence of yet another more distant planet.

First miss: In 1795, Frenchman Joseph Lalande actually stumbled across Neptune as he was making star maps. Upon checking his map later, he noticed one "star" wasn't where he had mapped it. Rather than realize he had found a new planet, he assumed he had made a mapping error and merely corrected his "error."

Second miss: In 1834 amateur astronomer Rev. J.T. Hussey produced evidence that something was disturbing Uranus' orbit. He wrote George Airy, prominent British astronomer and director of the Greenwich Observatory, who replied that the evidence was interesting but impractical. Hussey's idea was dismissed.

Third miss: Seven years later, Cambridge astronomy student John Couch Adams calculated a location for the suspected planet and sent it to Airy. Inexplicably, Airy didn't encourage a search.

Fourth miss: Unaware of Adams' work, French astronomer Urbain Jean Joseph Leverrier made calculations for the suspected planet which were very close to Adams'. When these were sent to Airy, he finally commissioned a search, but incredibly, the searchers did not focus on the spot suggested by both Adams and Leverrier.

Fifth miss: Leverrier tried unsuccessfully to interest astronomers at the Paris Observatory to search for the planet.

Finally, he got the attention of German astronomer Johann Galle of the Berlin Observatory. On September 23, 1846, after searching only a few hours, Galle and his assistant Heinrich d'Arrest found the planet which it seemed no one wanted to discover.

Neptune will be in our evening sky the rest of the year, yet it's too faint and tiny to see with the naked eye. So, the next time you're at a star party, ask to see Neptune. And listen carefully as you

might hear George Airy, who blew three chances to discover a planet, still kicking himself from his grave.

Next Two Weeks. Avg. sunrise: 7:02 a.m.; avg. sunset: 7:57 p.m. (exact for Waco, TX)

- * Tuesday's full Moon is called the Grain Moon and Green Corn Moon.
- * Thursday Jupiter and the Moon travel across the sky together all night.
- * The early evening of Aug. 31 the star Spica is just above Venus with fainter Mars to their right.
- * The Moon is at 3rd quarter Sep. 1.

Naked-eye Planets. In the early evening Venus, Saturn, and Mars are low in the west. Bright Jupiter rises soon after dark and by morning is high in the southwest.

Star Party. The Central Texas Astronomical Society's simultaneous free monthly star parties are Aug. 28 at the Lake Waco Wetlands and Belton's Overlook Park on Stillhouse Hollow Lake beginning at 8 p.m. For more information see www.centexastronomy.org.

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NASA Space Place

The Turbulent Tale of a Tiny Galaxy

by Trudy Bell and Dr. Tony Phillips

Next time you hike in the woods, pause at a babbling stream. Watch carefully how the water flows around rocks. After piling up in curved waves on the upstream side, like the bow wave in front of a motorboat, the water speeds around the rock, spilling into a riotous, turbulent wake downstream. Lightweight leaves or grass blades can get trapped in the wake, swirling round and round in little eddy currents that collect debris.

Astronomers have found something similar happening in the turbulent wake of a tiny galaxy that is plunging into a cluster of 1,500 galaxies in the constellation Virgo. In this case, however, instead of collecting grass and leaves, eddy currents in the little galaxy's tail seem to be gathering gaseous material to make new stars.

"It's a fascinating case of turbulence [rather than gravity] trapping the gas, allowing it to become dense enough to form stars," says Janice A. Hester of the California Institute of Technology in Pasadena.

The tell-tale galaxy, designated IC 3418, is only a hundredth the size of the Milky Way and hardly stands out in visible light images of the busy Virgo Cluster. Astronomers realized it was interesting, however, when they looked at it using NASA's Galaxy Evolution Explorer satellite. "Ultraviolet images from the Galaxy Evolution Explorer revealed a long tail filled with clusters of massive, young stars," explains Hester.

Galaxies with spectacular tails have been seen before. Usually they are behemoths—large spiral galaxies colliding with one another in the crowded environment of a busy cluster. Tidal forces during the collision pull gas and stars of all ages out of these massive galaxies to form long tails. But in IC 3418, the tail has just young stars. No old stars.

"The lack of older stars was one tip-off that IC 3418's tail isn't tidal," says Hester. "Something else must be responsible for these stars"

Hester and eight coauthors published their findings in the June 10, 2010, issue of *The Astrophysical Journal Letters*. The team described the following scenario: IC 3418 is speeding

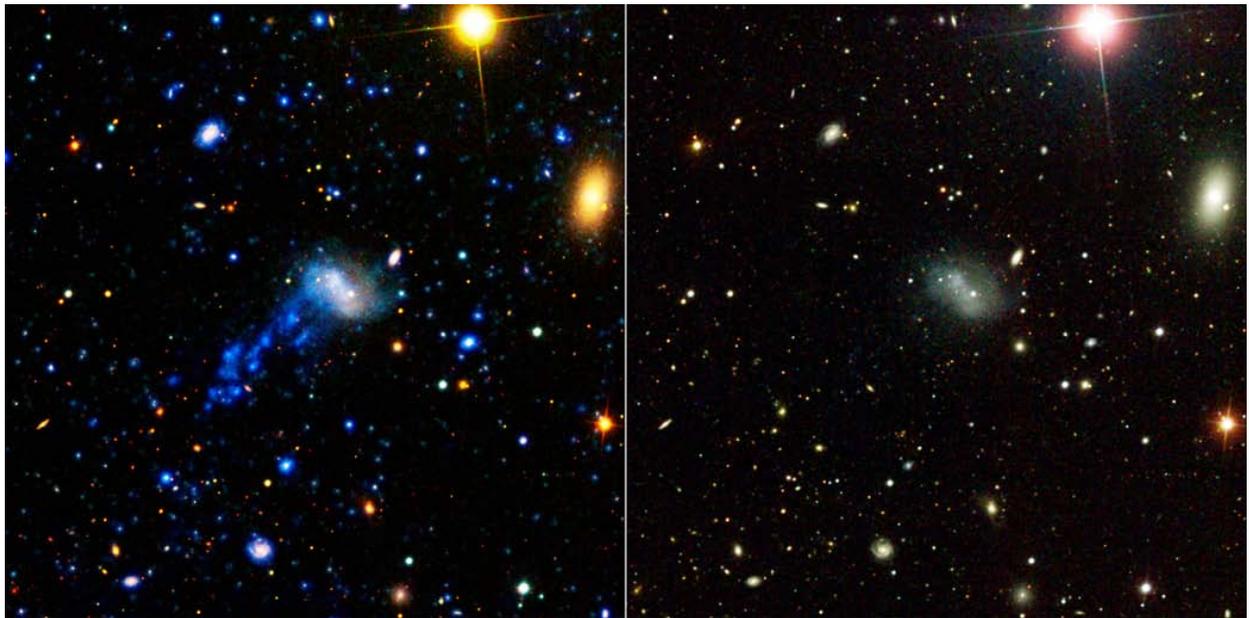
toward the center of the Virgo cluster at 1,000 kilometers per second. The space between cluster galaxies is not empty; it is filled with a gaseous atmosphere of diffuse, hot hydrogen. Thus, like a bicyclist coasting downhill feels wind even on a calm day, IC 3418 experiences “a stiff wind” that sweeps interstellar gas right out of the little galaxy, said Hester—gas that trails far behind its galaxy in a choppy, twisting wake akin to the wake downstream of the rock in the babbling brook. Eddy currents swirling in the turbulent wake trap the gas, allowing it to become dense enough to form stars.

“Astronomers have long debated the importance of gravity vs. turbulence in star formation,” Hester noted. “In IC 3418’s tail, it’s ALL turbulence.”

To many astronomers, that’s a surprising tale indeed.

See other surprising UV images from the Galaxy Evolution Explorer at

<http://www.galex.caltech.edu>. Kids (and grownups) can play the challenging new Photon Pileup game at <http://spaceplace.nasa.gov/en/kids/galex/phonon/>.



In the ultraviolet image on the left, from the Galaxy Evolution Explorer, galaxy IC 3418 leaves a turbulent star forming region in its wake. In the visible light image on the right (from the Sloan Digital Sky Survey), the wake with its new stars is not apparent.

Membership Status

The following membership changes took place in August:

Current Membership Total: 151

Renewals: 11

New student members:

Arlo Paulson - Westfield

New Members:

James Nocon – Indianapolis - returning from inactive list

Jayne Roper – Plainfield

David Huffman – Indianapolis

IAS LIBRARY:

There is now a link on our website page for our new Multi-Media Library. Greg has built this library of a multitude of videos that are on the web. We think it will be a great addition to our library for both novices and experienced observers. Greg has many more sources to go through so the library will continue to grow. If you have comments or questions about the library please contact Greg McCauley. (Contact Greg via the webpage iasindy.org under the contact us section)

Do you have a question or need?

We are establishing a list of members who would be willing to receive calls for help on specific objects. If you have a specific skill and would be willing to help others please contact Jeff Patterson KB9SRB@hotmail.com.

Based upon the responses we received to your intro question recently, perhaps we should add a section to the bulletin naming those members who would be willing to receive calls for help on specific subjects.

William Conner (wmtconner@att.net) - for CCD imaging and film photography.

Jeff Patterson (Contact Jeff via the webpage iasindy.org under the contact us section) –
Observatory design and construction

Eric Allen (ericandoberta@sbcglobal.net) - Telescope making and mirror grinding

Public Outreach Programs – If you want to schedule a program at the Link Observatory or at you site, please contact the following people:

Gerald Venne is our Public Events Coordinator. He will be responsible for coordinating Public Events for the IAS. To schedule a public event contact Gerald Venne (Contact Gerald via the webpage iasindy.org under the contact us section).

He needs your help. Let Gerald know if you would like to show the public our sky. We need people to help at Link and elsewhere. It is actually a lot of fun.

If you would like to schedule the Goethe Link Observatory, please contact John Shepherd. Contact John via the webpage iasindy.org under the contact us section)

Astro Ads

Are you changing or upgrading your equipment? Do you have or are you looking for astronomical materials and equipment? The Indiana Astronomical Society as a service to its members, will publish non-commercial ads at no charge. The ad will stay in the Bulletin for 4 months and may be renewed at the owner's request.

To place an ad, contact:

Bulletin Editor

Jeff Patterson

1780 S. Morgantown Rd.

Greenwood, IN 46143

(317) 300-0449

E-Mail: KB9SRB@Hotmail.com

For Sale

Meade LX200-ACF with advanced auto star guidance. Complete with tripod and foam case.
Used 2x \$2800

Norman York

Ph 765-628-2717

cell: 360-808- 0696

For Sale:

2 eyepieces for sale:
3mm Televue Radian
7mm Pentax SMC
Both for \$300

Jim Zdobyak
zobel@aol.com
317-862-4715

Equipment Loan Program

The Loan Program has been helpful to those new to the hobby and others in need of observing equipment. We consider offers of equipment you may not have need for any longer.

Did you know you could borrow a scope or piece of astronomy equipment from the Society and take it for a test drive? The Society has a program where members who are trying to determine what kind of equipment to buy can borrow one of the Society's scopes for a month or two and see how they like it. Philip Dimpelfeld is the chairman of the program and can arrange for your pickup and training on the use of the particular instrument. This is a great way to see what telescope you want to purchase. We have several scopes, eyepieces and binoculars to loan. Philip Dimpelfeld **Contact via the webpage iasindy.org under the contact us section**

Board Meeting – Board Meeting September 14, 2010

The IAS Board Meeting is being held at 430 Massachusetts Avenue in downtown Indianapolis. The building is at the point of convergence of Mass. Ave., Vermont and Alabama Streets. There is a Starbucks located in the frontage of the building. The coffee shop stays open late into the evening. Try to park as close to Starbucks as possible, preferably in a metered space. On-street parking is free after 5pm. Handicapped parking is directly in front of Starbucks entrance. The entrance to the building is to the left of Starbucks around on the side. We meet in the basement. Ride the elevator (around the corner to your left) to the basement. Turn right as you exit the elevator and go through the first door on your right. This is the conference/meeting room. If you need further assistance, please contact Jeff Patterson via the webpage iasindy.org under the contact us section

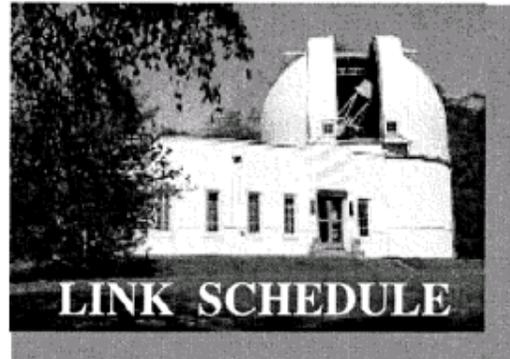
2010 Calendar of Meetings

	NAG	General	Board
January		9-Jan	12-Jan
February		6-Feb	2-Feb
March		13-Mar	9-Mar
April	24-Apr	10-Apr	13-Apr
May	22-May	8-May	4-May
June	19-Jun	5-Jun	8-Jun
July	24-Jul	10-Jul	13-Jul
August	21-Aug	14-Aug	17-Aug
September	18-Sep	11-Sep	14-Sep
October		16-Oct	19-Oct
November		13-Nov	16-Nov
December		18-Dec	

Goethe Link Observatory Observatory Address

**Goethe Link Observatory
8403 N. Observatory Lane
Martinsville, IN 46151**

Latitude: 39 degrees, 33 minutes north
Longitude: 86 degrees, 24 minutes west
Phone: (317) 831-0668



This schedule is being published to assure proper access to the Link Observatory for programs that are designed as observational, general education, astronomy conferences, or amateur research projects. Training programs are tentatively scheduled for Saturday evenings only. Although other requests can over-ride these sessions. It is the purpose of this listing to prevent activity conflicts.

If you need to acquire use of the 36-inch telescope: remember two important IAS guidelines: 1) *There has to be two or more IAS members present.....*2) *contact the Observatory Manager: John Shepherd* **Contact via the webpage iasindy.org under the contact us section. DON'T WAIT UNTIL THE LAST MINUTE TO MAKE YOUR REQUEST OR YOU MAY NOT GET ACCESS.**

IAS News & Views Stats

Accessing the IAS News & Views

The current bulletin can be found on the website www.iasindy.org

IAS News & Views deadline on the 20th of every month

The monthly newsletter welcomes articles of local astronomical interest information and want ads:

Please submit to

The Indiana Astronomical Society, Inc
 Jeff Patterson, editor
 1780 S. Morgantown Rd
 Greenwood, IN 46143
 Phone: (317) 300-0449
KB9SRB@hotmail.com

Membership information Contact via the webpage iasindy.org under the contact us section
 Contact any IAS officer or the Treasurer John Shepherd or Vicki Switzer

Observatory Manager
 John Shepherd **Contact via the webpage iasindy.org under the contact us section**

Public Event Coordinator
 Gerald Venne **Contact via the webpage iasindy.org under the contact us section**

Equipment Loan Program Coordinator
 Philip Dimpelfeld **Contact Phil via the webpage iasindy.org under the contact us section**

Membership Coordinator
 Vicki Switzer **Contact Vicki via the webpage iasindy.org under the contact us section**

September Calendar, 2010

For a more detailed Calendar of Events see the webpage www.iasindy.org

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 3rd QTR 	2	3	4
5	6	7	8 New Moon 	9	10 Campout at Link	11 Campout at Link General Meeting
12 Campout at Link	13	14 Board Meeting	15 1st QTR 	16	17	18 NAG
19	20	21	22	23 Full Moon 	24	25
26	27	28	29	30		