

The Bulletin – The monthly publication of the Indiana Astronomical Society

August, 2010
Volume 77, Issue 8
www.iasindy.org

The Bulletin



**The August General Meeting, August 14, 2010
8:00 PM
Goethe Link Observatory**

Finding Binaries (and maybe planets) in Star Clusters

Dr. Catherine Pilachowski

Indiana University Astronomy Department and Associate Dean for Graduate Education

The old galactic cluster NGC 752 in the constellation Andromeda is a good object for fall viewing. The billion-year-old cluster lies at a distance of about 1500 LY, and contains several dozen main sequence stars similar to the Sun. Since 2001, we've been observing the cluster with the WIYN 3.5-m telescope and Hydra multi-fiber spectrograph to search for radial velocity variables. A new technique provides velocity precision of about 100 meters per second (just about qualifying speed at Indy!) in radial velocity, and allows us to identify velocity variables with lower amplitudes than previously possible in the cluster – and maybe even planets!

Caty Pilachowski has held the Daniel Kirkwood Chair in Astronomy at Indiana University Bloomington since 2001. She is an IAS member and is active in encouraging public outreach effort in astronomy. In her research, she studies the chemical compositions of stars and the chemical evolution of star systems, concentrating mostly on star clusters. Before coming to IU, she served on the scientific staff of the Kitt Peak National Observatory in Arizona and as Project Scientist for the WIYN 3.5-m telescope, which she now uses for her research. Caty is currently serving as Associate Dean for Graduate Education in the IU College of Arts and Sciences.

IAS NEWS

The Bulletin

The contest for the name change for the Bulletin is ongoing. It ends August 13. Go to our yahoo group and go to polls and vote. There are five submitted names and the old name The Bulletin. Please vote for your choice.

The Editor

IAS Calendar of Events for August

August 5-8 - Indiana Family Star Party

August 14– General Meeting at Link Observatory

August 17 – Board Meeting

August 21 – NAG at McCloud

Observing Activities

Activities for August:

Link Observatory

August 14 General Meeting

McCloud Activities–

NAG – August 21

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.

Link Campout a Great Success

Although the ground was wet on Friday night and we could not drive in the back area, John Shepherd and I opened the observatory and took the 36" for a spin. We were able to get the bugs out of it and had a ball. Saturday night turned out to be a great night as well and we had our first observing session of the year at the Link. We had approximately 46 people there including a few guests. There was great interest in the 36" and we were busy until about 1 am. John Shepherd and I had observed all night the night before and were beat so we closed up the scope and went home.



Indiana Family Star Party

This is a reminder to previous participants that this year's Indiana Family Star Party (IFSP) and Astronomical League GreatCon will be held August 5-8 at Camp Cullom. We believe the IFSP offers the best Big Bang for your buck in the area for a family-oriented astronomy event. Please see www.indianastars.us/starparty/ for more information. You can save money if your pre-registration is postmarked by July 26. A registration form may be downloaded from the web site.

If you are currently unemployed as the result of a layoff or RIF, and you're experiencing severe financial hardship, we have a limited number of assistantships available. In exchange for a few hours of your time to help run the star party, part or all of your registration fee may be waived. Please contact me (wyncott@verizon.net) if you'd like to be considered for one of the assistantships.

This is a star party that the IAS cosponsors. If you would like to help contact Gerald Venne.

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 month 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

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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 August 21, 7:30 PM**

Learning the August 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

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- 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

Nebraska Star Party – August 8th - 13th, 2010 - North Central Nebraska - This is a premier dark site and has fantastic observing. However, the weather can be brutal. Temperatures can reach 105-110 degrees. However you can cool off in the shade of the tree. All activities will be at the Snake Creek Campground at Merritt Reservoir. <http://www.nebraskastarparty.org/>

Indiana Family Star Party Camp Cullum, Frankfort, IN August 5-8, 2010
<http://jmmahony.home.insightbb.com/pgo/starparty/>

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
<http://www.chiefland.com/chieflandastronomyvillage.php>

AlCor Observations

Bill Conner

BINOCULAR MESSIER CLUB

As the weather dries up this Fall, we hope, there are fun star parties to attend. It is a good time to haul out your binoculars and observe many of the brighter Messier objects. There are many star clusters and nebula that roll across the southern sky in Scorpius, Sagittarius and Scutum as well as many overhead. Even bright M31 and M33 grace the early morning sky.

To qualify for the AL's Binocular Messier Certificate and pin, you need only choose and observe 50 Messier objects using only binoculars. Any pair of binoculars may be used, but those with objectives between 35mm and 80mm in diameter are recommended. I was able to do mine with 9 x 35mm binoculars from a dark sky site. To record your observations, you may use an AL logsheet, see Astronotes #3, or create your own. The required information includes: the name of the object; date and time of the observation; and estimate of the seeing and transparency; the size and power of the binoculars used; and a brief description of what you were able to see. For more information and downloadable copies of very helpful Messier observing aids, log into the Astronomical League website at: <http://www.astroleague.org> and page down to the Observing Clubs link under "Navigation" on the left side of the screen. This will open up a list of the clubs. The Binocular Messier club is near the top of the list. There are instructions and three appendices under this header to assist you in choosing which objects to try for.

HINTS:

Know your binocular field-of-view. This is usually stamped on the binocular along with the power and objective diameter. For example, 4 degrees, 7 x 50. Many list the field of view in feet at 1000 yards. In this case you will have to pick two stars, perhaps in the big dipper, that are at opposite sides of your field of view and figure out the separation. With "field of view" in hand you can match up what you see in the binocular with your chart.

Always start with a reference star that you can see with your naked eye. For example, here is a description for M57, the Ring Nebula: "From the star Vega in the constellation Lyra, I sweep South South East (SSE) one field of view and see a fuzzy smudge roughly half-way between Beta Lyrae and Gamma Lyrae. This smudge is identified as M57 on my star chart." The cluster appears round and I cannot make out individual stars.

Remember that the AL Awards reviewer must be able to recreate your observation in order verify that you actually located the object. Doing this in a group at a star party or in your back yard with friends can be a lot of fun.

AAVSO Writer's Bureau

Jul 23, 2010

[A Question of Identity](#)



KAIT telescope

Question: When is a supernova not a supernova?

Answer: Now that's an interesting story...

It all started on Christmas night 2005, when astronomers using the Katzman Automatic Imaging Telescope (KAIT) in California discovered an apparent supernova not far from the center of the elliptical galaxy NGC 2274. There was nothing there on an image they had taken two weeks prior. Twelve hours later, Astronomers at the National Astronomical Observatory of China confirmed the 18th magnitude object was real. It was named SN2005md and the discovery was announced in CBET #332 on December 26.

A spectrogram taken on December 28 showed it to be most probably a "young Type-II supernova". This was announced in an IAU Circular (8650) on the 29th of December. Subsequent KAIT images showed that SN2005md faded rather quickly and it was fainter than magnitude 19.8 by January 2006.

Normally that would be the end of the story, but this time it wasn't.

First, it is generally accepted that the progenitors of core-collapse supernovae are massive young stars. These massive young stars are almost always found in spiral or irregular galaxies dominated by young stellar populations.

NGC 2274 is a strangely shaped early irregular galaxy (an E-type galaxy), so SN2005md was unusual. In fact, it was only one of 22 examples found in an extensive literature search of all early

irregular galaxies containing core-collapse supernovae in history.

A paper published in 2008 by Hakobyan et al. (2008, A&A, 488, 523) examined all these cases and found that 19 of the galaxies had been mis-classified, and were actually spiral (17), irregular (1) or ring (1) galaxies. Of the 3 remaining galaxies with early type classification, one (NGC 2768) is a suspected merger remnant, another (NGC 4589) is definitely a merger, and the third (our NGC 2274) is in close interaction with another galaxy. This seemed to explain the contradiction of core-collapse stars residing in old non-star-forming irregular galaxies, since some amount of young stellar population in these interacting galaxies is expected.

Well then, all was right in the Universe once more...or was it.

In February 2008, while Hakobyan and company were putting the final touches to their paper for submission, an electronic telegram (CBET 1265) was issued announcing that either a new supernova in NGC 2274, very close to the position of SN2005md has erupted at magnitude 18.5, or that SN2005md itself had suddenly re-brightened!

The difference between the previously reported position of SN2005md and the "new" object was on 0.1 arc seconds in R.A. and 0.4 arc seconds in declination, but at the distance of NGC 2274 (estimated to be 70 mega parsecs) that could mean they were unrelated objects 120 parsecs apart. Measuring the exact positions of anything that faint close to a galaxy is tricky business and the likelihood they were the same object seemed greater than the probability they were two SN in the same galaxy that close together.

The fact that the previously reported spectrum only showed a featureless blue continuum, with no obvious broad supernova features, and that the object faded so quickly added to the suspicion that SN2005md wasn't a supernova at all.

The telegram went on to explain if the new object was indeed a re-brightening of 2005md, possible explanations were that it was the super-outbursts of a luminous blue variable (LBV), or multiple flares of the LBV as part of an extended eruption. Other possible explanations included a Galactic variable star or a background AGN/blazar.

Needless to say, SN2005md was a mystery. Further observations were encouraged.

Flash forward to July 2010. Astronomers Telegram (ATEL) #2750 finally sorts it all out for us. A fully reduced spectrum taken with the LRISp on the Keck I 10 meter telescope on December 31, 2005 shows that the object originally classified as a young Type IIb supernova is in fact a galactic cataclysmic variable. That's right, it's in our own Milky Way galaxy. NGC 2274 just happens to lie in the background very close to its position on the sky. The CVs spectrum shows features typical of a dwarf nova in outburst. The Balmer emission lines were the clincher. They have an average redshift of about 300km/second, which is far too little to be part of a galaxy estimated to be receding from us at 5000+km/second.

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This also explains the re-brightening in 2008, since CVs are prone to outburst over and over on various timescales from weeks to years. It also resolves the conundrum of having a core-collapse supernova in an E-type galaxy with few signs of active star formation.

And once again, order has been restored to the Universe.

The only mystery that remains is why it took them so long to figure this out. The spectrum that resolved this issue was obtained New Years Eve, 2005!

NASA Space Place

The Sun Can Still Remind Us Who's Boss

by Dr. Tony Phillips

Grab your cell phone and take a good long look. It's indispensable, right? It tells time, surfs the web, keeps track of your appointments and, by the way, also makes phone calls. Modern people can hardly live without one.

One good solar flare could knock it all out.

"In the 21st century, we're increasingly dependent on technology," points out Tom Bogdan, director of NOAA's Space Weather Prediction Center in Boulder, Colorado. "This makes solar activity an important part of our daily lives."

Indeed, bad space weather can knock out power systems, telecommunications, financial and emergency services—basically, anything that needs electronics to work. That's why NOAA is building a new fleet of "space weather stations," the GOES-R satellites.

"GOES-R will bring our existing fleet of weather satellites into the 21st century," says Bogdan. "They're designed to monitor not only Earth weather, but space weather as well."

NOAA's existing fleet of Geostationary Operational Environmental Satellites (GOES) already includes some space weather capabilities: solar ultraviolet and X-ray telescopes, a magnetometer and energetic particle sensors. GOES-R will improve upon these instruments and add important new sensors to the mix.

One of Bogdan's favorites is a particle detector named "MPS-Low," which specializes in sensing low-energy (30 eV – 30 keV) particles from the sun.

Who cares about *low-energy* particles? It turns out they can be as troublesome as their high-energy counterparts. Protons and other atomic nuclei accelerated to the highest energies by solar flares can penetrate a satellite's exterior surface, causing all kinds of problems when they reach internal electronics. Low-energy particles, particularly electrons, can't penetrate so deeply. Instead, they do their damage on the outside.

As Bogdan explains, "Low-energy particles can build up on the surfaces of spacecraft, creating a mist of charge. As voltages increase, sparks and arcs can zap electronics—or emit radio pulses that can be misinterpreted by onboard computers as a command."

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The Galaxy 15 communications satellite stopped working during a solar wind storm in April 2010, and many researchers believe low-energy particles are to blame. GOES-R will be able to monitor this population of particles and alert operators when it's time to shut down sensitive systems.

“This is something new GOES-R will do for us,” says Bogdan.

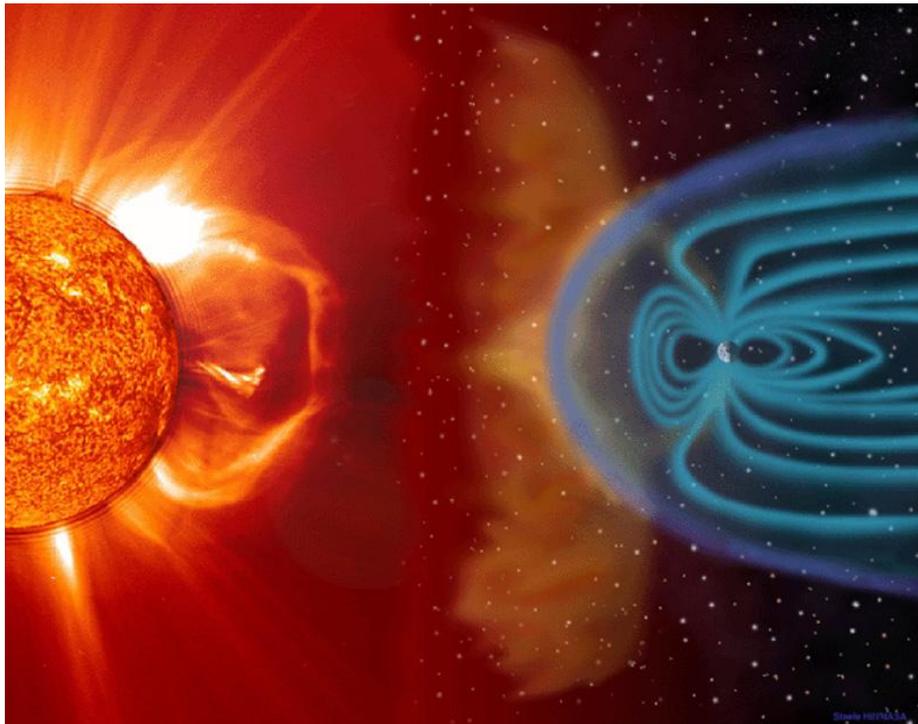
The GOES-R magnetometer is also a step ahead. It will sample our planet's magnetic field four times faster than its predecessors, sensing vibrations that previous GOES satellites might have missed. Among other things, this will help forecasters anticipate the buildup of geomagnetic storms.

And then there are the pictures. GOES-R will beam back striking images of the sun at X-ray and extreme UV wavelengths. These are parts of the electromagnetic spectrum where solar flares and other eruptions make themselves known with bright flashes of high-energy radiation. GOES-R will pinpoint the flashes and identify their sources, allowing forecasters to quickly assess whether or not Earth is in the “line of fire.”

They might also be able to answer the question, *Is my cell phone about to stop working?*

The first GOES-R satellite is scheduled for launch in 2015. Check www.goes-r.gov for updates. Space weather comes down to Earth in the clear and fun explanation for young people on SciJinks, <http://scijinks.gov/space-weather-and-us>.

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



In spite of Earth's protective magnetosphere, solar storms can wreak havoc with Earth satellites and other expensive electronics on the ground.

Membership Status

Current Membership Total: 149

Renewals: 9

New student members: 0

New Member:

Sean Barr – Westfield, IN

Inactive status:

Chris Mendoza – Mooresville

James Nocon - 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 (ericandroberta@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.

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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 August 17, 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

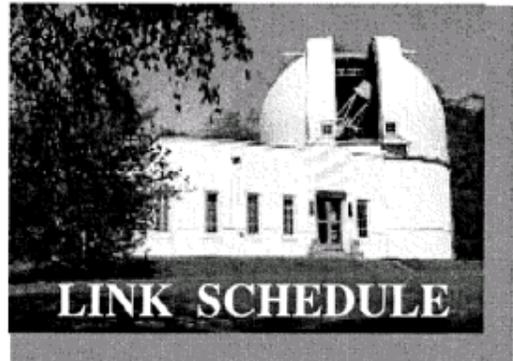
	NAG	General	Board
January		9-Jan	12-Jan
February		6-Feb	2-Feb
March		13-Mar	9-Mar
April	24-Apr	10-Apr	13-Apr
May	22-May	8-May	4-May
June	19-Jun	5-Jun	8-Jun
July	24-Jul	10-Jul	13-Jul
August	21-Aug	14-Aug	17-Aug
September	18-Sep	11-Sep	14-Sep
October		16-Oct	19-Oct
November		13-Nov	16-Nov
December		18-Dec	

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.**

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Bulletin Stats

Accessing the Bulletin

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

Bulletin 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**

August Calendar, 2010

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 3rd QTR 	4	5 IFSP	6 IFSP	7 IFSP
8 IFSP	9 New Moon 	10	11	12	13	14 General Meeting Link Campout
15	16 1 st QTR 	17 Board Meeting	18	19	20	21 NAG
22	23	24 Full Moon 	25	26	27	28
29	30	31				

Membership Application to the IAS

Benefits:

- Use of the Goethe Link Observatory
- Formal monthly programs with guest speakers
- Local and regional astronomical functions
- Discounted Astronomy publications
- New Moon observing activities
- Access to IAS member experts and problem solving
- The Bulletin monthly newsletter
- Membership in the Astronomical League
- Free admission to the Holcomb planetarium
- Star party events and observing sessions
- Membership in the Yahoo group IAS-Indy Indiana Astronomical Society

Please mark whether this is a new or renewal application

New

Renewal

Note: Magazine subscription renewals forms and payment must be submitted to the Treasurer in order to maintain publisher's club discount.

Name: _____

Address: _____

City: _____ State: _____ ZIP: _____

Telephone: () _____

E-Mail Address: _____

IAS-Indy @yahoo.com - This service is our main communication tool. IAS-Indy The Indiana Astronomical Society is accessible only by IAS members. It is controlled very carefully to prevent spam. Upon receipt of your membership application, you will receive an invitation to join the group.. You must have a Yahoo account which is free.

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How do you want to receive the IAS monthly newsletter?

Downloadable from Website Hard Copy*

* Please note that hard copy costs the Society about \$1.50 per issue. Please consider this when selecting mode of receiving the newsletter.

Annual Regular Membership (\$30.00)	
Annual Student Membership (\$10.00)	
Astronomy Magazine Renewal (\$34.00)	
Sky and Telescope Magazine (\$33.00) (New Subscription)	
Total Enclosed	

Make checks payable to: The Indiana Astronomical Society, Inc

Please complete Member Profile and include with the application

Mail Application to:

Vicki Switzer Membership Coordinator
2115 N. Private Rd 50 E
Centerpoint, IN 47840

Member Profile

Spouse's Name: _____

Children's names and ages: _____

Note: Profile information is not a requirement for membership to the Society.