



# The Bulletin

**The May General Meeting, April 10, 2010  
7:00 PM  
Holcomb Observatory**

**Due to the fact that the reconstruction at the Link Observatory is still going on, the may general meeting will be at the Holcomb Observatory.**

## **"Digital Image Processing"**

**Doug Sangunetti**

In his talk Doug will cover the following topics:

- What exactly is a digital image?
- What does a raw astro-image look like?
- What are the common astro-image defects?
- How do you repair the defects?
- What does it mean to stack images?
- How do you combine 3 monochrome images taken through color filters to create a color image?
- What is a narrow-band or "false color" image?
- How do you combine 3 monochrome images taken through narrow-band filters to create a false color image?
- What is the Flexible image Transport System (FITS) data format?
- How you can Process Hubble Space Telescope Images yourself

I will also give a short demonstration showing how to process a stack of raw images using "CCDStack" image processing software.

I first became interested in Astronomy in elementary school. I remember reading through every Astronomy book in the school library when I was in sixth grade. I dreamed of one day being able to take pictures like the ones in the books I was reading. I never imagined that I would be able to produce much better images than those in the library books with equipment that I owned myself. My parents bought my first telescope, a 4" Newtonian reflector on a horribly shaky mount. Without any guidance on how to use it, I tried and failed to see any of the galaxies I saw in those pictures. I soon lost interest in observing, but still hoped to be able to image galaxies

someday. I became interested in Astronomy again when I moved to a house in northern Hamilton County. I bought an 8" LX10 and tried to use that with a film camera to take pictures of the moon. The results were not great, but my interest was piqued. I soon discovered that what I really needed was a digital Astro camera, a new mount, a new scope etc, etc, etc. I am still learning with every new attempt and still seeking that perfect image. You can see some of the results at <http://www.dougaastro.net>.

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## IAS Calendar of Events for May

May 4 – Board Meeting

May 8 – General Meeting at Holcomb Observatory

May 22 – NAG at McCloud

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## Activities for May:

### Link Observatory

None Scheduled

**Note the Observatory is closed for remodeling and will reopen about the 1st of June.**

### McCloud Activities–

NAG – April 24

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 Gary Schoppenhorst 1 317 297-1405.

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.

## 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](http://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 fall, 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](mailto: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](mailto:catyp@astro.indiana.edu).

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### **NAG Observing was a Bust**

Well our first outing of the year was limited to our indoor presentation as the spring rains of Indiana made going out impossible.

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### **New Astronomer's Group Meeting McCloud Nature Park Saturday May 22 7:30 PM**

It's spring again and time for the second monthly meeting of the Indiana Astronomical Society's New Astronomers Group for 2010. We will be meeting on Saturday May 22 at McCloud Nature Park starting at 7:30 pm.

### **THE NAG MEETING WILL BE HELD - RAIN OR SHINE.**

Discussion topics for this month:

Navigation

Our Solar System

Lunar phases

Observing the May Evening Sky and how to find these objects

Question and answer session

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

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

We need IAS members to be ambassadors and meet the public and show our hobby. Pray for good weather.

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## **ALCor Observations**

By Bill Conner

### **PREPARATIONS FOR ATTENDING A STAR PARTY**

Spring weather brings opportunities to attend star parties near and far. Careful preparation will make the difference between a great time or a frustrating experience. The following paragraphs outline key things to do before you travel.

First, make your reservations in a timely manner so that you don't have to pay extra at the gate or worse yet be turned away. Major star parties like the Winter Star Party in Florida and Texas Star Party in West Texas are frequently sold out. Make certain that your ticket is with you when you depart. Plan your route carefully so that you arrive in time to get registered and set up before dark.

Next, take a good look at the astronomy related gear that you plan to use. If it has been in the shed all Winter it may be prudent to set it up to see if it works, and to make certain that you have all the necessary parts. Load in the reference material that you plan to use such as charts and books relating to the observing that you plan to do. Purchase spare batteries for each item and make certain that you have fuses for the power supplies you plan to use. Pack extension cords as appropriate. If a computer is part of your gear, bring along your recovery disks and copies of the critical applications that you intend to use. Pack your instruction manuals and a small repair kit for emergencies. I always bring small tools, soldering iron & solder, spare connectors for cables, hook and loop fasteners and a roll of duct tape. A mallet comes in handy for setting tent stakes or hold downs for your telescope.

Ancillary equipment like a step stool, roll-up table, folding chair and perhaps a canopy to ward off the sun come in handy. I also carry mosquito repellent and sun screen. Check out your shelter, be it a tent camper or RV. Have your vehicle serviced before taking any long trip. Remember to bring the charger for your cell phone and camera.

Bring towels, personal gear and clothing to suit the expected weather. Don't forget the rain gear and a big floppy hat. Sunburn is no fun as many attendees at the Winter Star Party discover. It gets cool overnight. Bring warm clothes so you can enjoy the night sky without shivering. Sleeping gear appropriate for the weather will ensure that you get some rest when not observing. An extra pair of shoes or boots and shower shoes come in handy.

Lastly, check the 10 day weather forecast for the star party. It is no fun looking at the underside of clouds all week. If necessary, check for an alternate venue with better weather. It is no big deal to forfeit an entrance fee, but spending \$500 dollars on gas is another matter.

## From the Space Place

### A Rock Hound is Born

It's tough to be a geologist when you can't tell one rock from another. Is that a meteorite or a chunk of lava? A river rock or an impact fragment? Houston, we have a problem!

It's a problem Spirit and Opportunity have been dealing with for the past six years. The two rovers are on a mission to explore the geology of the Red Planet, yet for the longest time they couldn't recognize interesting rocks without help from humans back on Earth.

Fortunately, it is possible to teach old rovers new tricks. All you have to do is change their programming—and that's just what NASA has done.

"During the winter, we uploaded new software to Opportunity," says Tara Estlin, a rover driver, senior member of JPL's Artificial Intelligence Group, and the lead developer of AEGIS, short for Autonomous Exploration for Gathering Increased Science. "AEGIS allows the rover to make some decisions on its own."

Estlin and her team have been working for several years to develop and upload increasingly sophisticated software to the rovers. As a result, the twins have learned to avoid obstacles, identify dust devils, and calculate the distance to reach their arms to a rock.

With the latest upgrade, a rock hound is born.

Now, Opportunity's computer can examine images that the rover takes using its wide-angle navigation camera (NavCam) and pick out rocks with interesting colors or shapes. It can then center its narrower-angle panoramic camera (PanCam) on targets of interest for close-up shots through various color filters. All this happens without human intervention.

The system was recently put to the test; Opportunity performed splendidly.

At the end of a drive on March 4<sup>th</sup>, the rover settled in for a bit of rock hunting. Opportunity surveyed the landscape and decided that one particular rock, out of more than 50 in the NavCam photo, best met criteria that researchers had set for a target of interest: large and dark. "It found exactly the target we would want it to find," Estlin says. "It appears to be one of the rocks tossed outward onto the surface when an impact dug a nearby crater."

The new software doesn't make humans obsolete. On the contrary, humans are very much "in the loop," setting criteria for what's interesting and evaluating Opportunity's discoveries. The main effect of the new software is to strengthen the rover-human partnership and boost their combined exploring prowess.

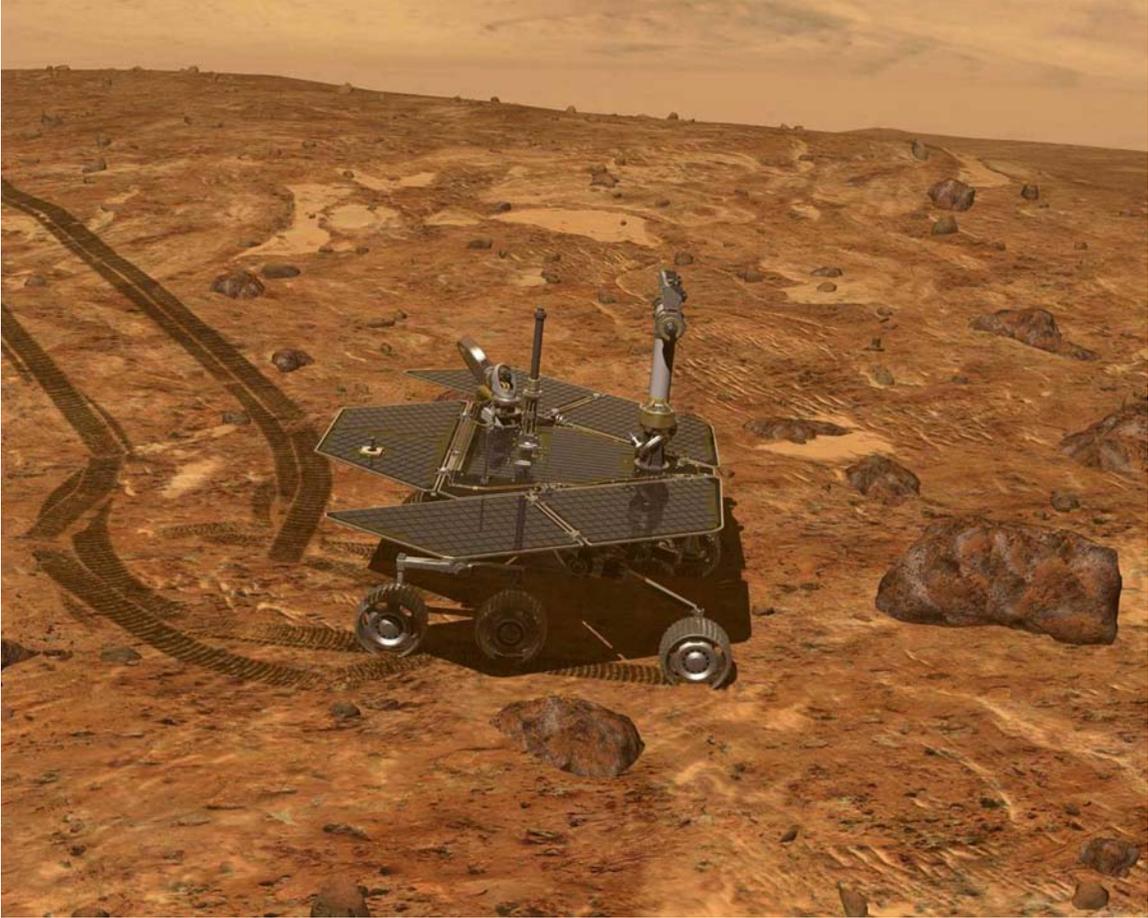
Mindful that Opportunity was only supposed to last about six months after it landed in 2004, Estlin says "it is amazing to see Opportunity performing a brand new autonomous activity six years later."

What will the rock hounds of Mars be up to six years from now? Stay tuned for future uploads!

Learn more about how the AEGIS software works at

<http://scienceandtechnology.jpl.nasa.gov/newsandevents/newsdetails/?NewsID=677>. If you work with middle- or high-school kids, you'll find a fun way to explore another kind of robot software—the kind that enables "fuzzy thinking"—at

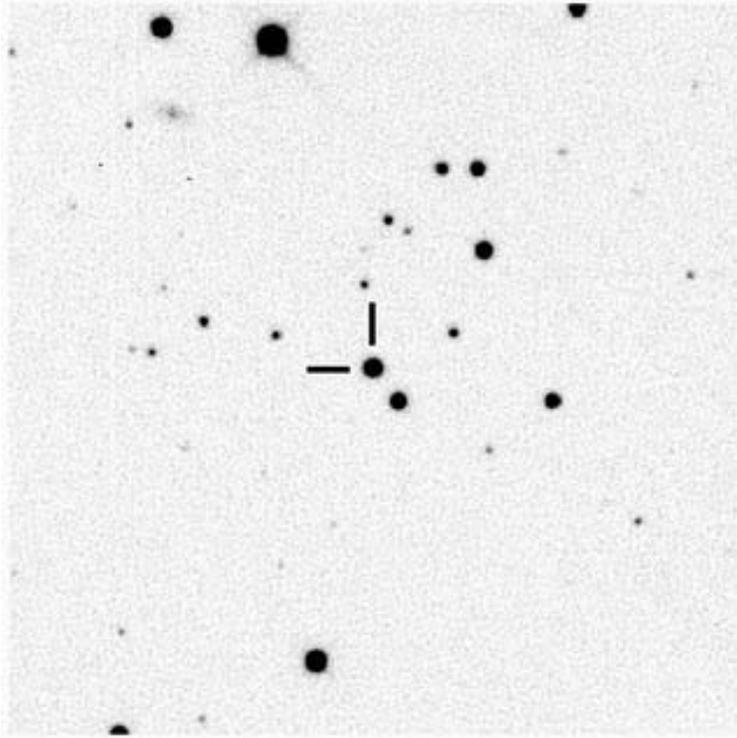
[http://spaceplace.nasa.gov/en/educators/teachers\\_page2.shtml#fuzzy](http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml#fuzzy).



*Opportunity spots a rock with its NavCam that its AEGIS software says meets all the criteria for further investigation.*

## [A Cataclysmic Variable in the Field of the Kepler Mission](#)

By Kurtis Williams, [Professor Astronomy](#)



In September of 2008, I was sitting at the controls of the [McDonald Observatory](#) 2.1-meter [Struve Telescope](#). I was there to help some of my colleagues who work on a team associated with NASA's [Kepler Mission](#). This team, the Kepler Astroseismic Science Consortium, isn't on the lookout for planets. They are studying the stars themselves, looking for variations in the light from stars caused by sound waves in the star. The study of these sound waves, known as [asteroseismology](#), allows astronomers to probe the interior structure of a star, just like geologists use [seismic waves from earthquakes to study the interior of the Earth](#).

My specific goal at the telescope was to look for pulsating white dwarfs. While around a hundred pulsating white dwarfs are known in the sky, none are known in the patch of sky where the Kepler mission stars. I had a long list of candidates, some that I chose, and some that our European collaborators selected. One of the stars selected by Viennese astronomer [Gerald Handler](#) and his collaborators, the star in the center of the picture above, had been observed with the [Telescopio Nazionale Galileo](#) in the Canary Islands, and looked "interesting".

So, my job was to follow up on the interesting star. I pointed the telescope and started taking pictures, measuring how bright the star was every 10 seconds. The pulsating white dwarfs we look for vary their brightness in a very regular fashion, getting brighter and fainter by a few percent every few minutes. At first, this star looked like it was doing exactly that, and then, in a space of just a couple of minutes, the star got a whopping 20% brighter. I could actually see on

the computer screen that the star had brightened relative to the other stars (this is very rare; we need computers to tell us about the few percent variations).

I knew then that this was not a pulsating white dwarf, and I suspected it was a [cataclysmic variable](#), or CV, where a white dwarf is pulling material off of another star. I suspected this because CVs often show this behavior of getting suddenly brighter and fainter. The rest of that night, and some of the following night, I saw this variability of the star. I notified our European contacts, who looked with a telescope in Bologna and verified the variability. At this point I also started to blog about it, but was then asked not to say much. If we had found something new, we wanted to make sure we got the data we needed to publish a paper and not be scooped by someone else.

Our next step was to make sure that we had actually discovered something new, so we scoured journal articles, online databases, and various catalogs, and while we found the star listed in some basic catalogs, nobody had ever studied it or determined that the star was a CV. What we needed, though, was a spectrum of the object. [Spectroscopy, the analysis of the different colors of light coming from an object](#), allows us to identify uniquely each object, as well as garner a lot of additional information.

None of us had time on a telescope with a spectrograph before the star went behind the sun for the winter. But two of my friends and colleagues were using the [MMT](#) and its spectrograph later that month, so I asked them if they might look at it. The first of them didn't have much time but grabbed a quick spectrum, which he misinterpreted as a "normal" white dwarf star, so he went on with his program. That's fine, these things happen. But we got lucky with my other colleague, [Patrick Dufour](#) (who [has made some very interesting discoveries on his own](#)). When he got on the telescope, the wind was coming out of the east so fast that he could not safely point the telescope any direction but west, and all of his targets were in the east. Our star was in the west. So, Patrick very kindly pointed the telescope west and took about 90 minutes of spectral data. (He could just as easily closed the dome and gone to bed, and we would have been none the wiser).

Patrick's high-quality data proved that this star is a cataclysmic variable, and even allowed us to start to classify what kind of CV it is. CVs come in many flavors, so one of the most basic bits of analysis for a new CV is to fit it into the existing classification scheme, if possible. So, we managed to narrow down its class somewhat, though there is still more work that needs to be done. This star is definitely a nova-like variable of the [UX Uma](#) class, and it may belong to the [SW Sextantis](#) subclass. (To compare to a topic that may be more familiar, this is like saying we found a creature that we know is a mammal, we know is a primate, and we know is a great ape, but we're not yet sure if it is a gorilla or a chimpanzee.) To make a better classification, we need better data. But since this star is outside my area of expertise, we published the information that we have so other people can go and dig deeper.

To me, the exciting thing about this discovery is that the CV is in the field of view of the Kepler mission (I think four or five others are known in the Kepler field). Kepler is just a phenomenal instrument, and its ability to stare at an object for months on end and to obtain very high precision measurements mean that people who study CVs can try new avenues of analysis that have never been done before. This is illustrated by the recent [discovery by Kepler of Doppler boosting](#), a brightening of light from an object due to its motion toward you (like a Doppler shift). This boosting effect is very tiny for the majority of objects in the Universe, but Kepler can measure it. In fact, Kepler has already looked at this system for about a month, and those data should be

available for download very soon.

So, in short, we found an interesting cataclysmic variable in the same region of the sky that the Kepler mission is looking. We don't have more than a basic description, and some of the important parameters and classification of the system remain to be done. However, since I only dabble in the field of cataclysmic variables, I probably won't be doing much more with this star. Some of my collaborators may well be working on it, and because we've published it other researchers can feel free to follow up on it, too. All of them can do a better and more efficient job studying this star than I can as a newbie. So, friends, have at it!

Kurtis A. Williams, Domitilla de Martino, Roberto Silvotti, Ivan Bruni, Patrick Dufour, Thomas S. Riecken, Martin Kronberg, Anjum Mukadam, & G. Handler (2010). Discovery of a Nova-Like Cataclysmic Variable in the Kepler Mission Field *The Astronomical Journal*, in press, (arXiv: [1004.3743v1](http://arxiv.org/abs/1004.3743v1))

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## UP Coming Star Parties

**Texas Star Party** West Texas May 9-16, 2010. This is a premier party with very dark skies and a great site. Just a long way. Online registration will open November 15.

[www.texasstarparty.org](http://www.texasstarparty.org)

**Michiana Star Party** Potawatomi Wildlife Park near Tippecanoe Indiana May 14-16, 2010

Contact Michiana Astronomical Society for information and registration. [www.michiana-astro.org](http://www.michiana-astro.org)

**Apollo Rendezvous** – Dayton, Ohio June 11 - 12

<http://mvas.org>

**Two Rivers Spring Star Party** May 13-16

[www.freewebs.com/tworiversstarparty](http://www.freewebs.com/tworiversstarparty)

**JEPC Star Gazing Event** IL June 10-13

<http://www.mikewolford.com/IEPC%20Event.htm>

**Cherry Springs Star Party** Cherry Springs State Park, PA June 10-13

<http://www.astrohbg.org/cssp/information>

**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/>

**Earth Wind and Sky Star Party** August 5-8

[www.freewebs.com/earthwindsky](http://www.freewebs.com/earthwindsky)

**Indiana Family Star Party** Camp Cullum, Frankfort, IN August 5-8, 2010

<http://jmmahony.home.insightbb.com/pgo/starparty/>

**Astrofest** Kankakee IL Date To be announced

[www.chicagoastro.org](http://www.chicagoastro.org)

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**Black Forest Star Party** PA September 10-12

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

**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](http://www.wkaa.net)

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

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## **Membership Status**

**The following changes in membership took place in April: Total Membership 146**

**Renewals: 6**

**New student members: 0**

### **New Members:**

Jim Parr – Martinsville

Tony Wolski - Carmel

Frank Wu - Indianapolis

Jim Haerberle - Bloomington

### **Inactive status:**

Katherine David – Indianapolis

(moved – no forwarding address)

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## **IAS LIBRARY:**

The complete list can be found (<http://www.iasindy.org/memonly/iasfiles.php>, which is password protected). We have a new additions for the 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. The only problem is that you will have to have high speed internet to observe these video streams. 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 at 317 663-3289 or [greg@ultrasoundconsulting.net](mailto:greg@ultrasoundconsulting.net) .

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## **Easy Listening:**

Weekly pod casts are available at <http://www.astronomycast.com/> for those who love astronomy and want to learn, yet have no time (or desire) to do extra reading. They cover a variety of topics, and feature a different topic each week, so you can choose your flavor. The cast includes Fraser Cain, the publisher of Universe Today (<http://www.universetoday.com/>), and Dr. Pamela Gay, an assistant professor of physics at Southern Illinois University Edwardsville. You do not need an iPod or portable device to enjoy these.

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We are reinstating the mentor program, which will provide the new member with lots of information and help them assimilate into the Society. Thad Hatchett has volunteered to lead this program. We need your help. If you are interested in becoming a mentor please contact me at Jeff Patterson [KB9SRB@hotmail.com](mailto:KB9SRB@hotmail.com) or Thad Hatchett at [astronomynut@comcast.net](mailto:astronomynut@comcast.net). We will put your name on the list and assign a new person to you. Our goal is to retain people and make this hobby a lot more fun.

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### **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](mailto: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](mailto:wmtconner@att.net)) - for CCD imaging and film photography.  
Jeff Patterson ([KB9SRB@Hotmail.com](mailto:KB9SRB@Hotmail.com)) – Observatory design and construction

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### **Public Outreach Programs – If you want to schedule a program at the Link Observatory or at your 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 1 317 826-2680. 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 Link, please contact Gary Schoppenhorst at 1-317-297-1405 or at [schoppy@att.net](mailto:schoppy@att.net)

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### **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](mailto:KB9SRB@Hotmail.com)

**For Sale**

Celestron NexStar 8 Computerized GoTo Telescope  
8" Schmidt-Cassegrain Optical Tube  
GoTo Computerized Mount with 14,000 Object Database  
Auto Align and Auto Tracking Work Great  
Telescope is in Excellent Condition

**Includes:**

1-1/4 Visual Back  
1-1/4 Diagonal  
15 MM Celestron Eyepiece  
40 MM Celestron Eyepiece  
Celestron Lens Shade for C8  
Heavy-Duty All Metal Tripod  
Celestron Red Dot Finder  
Bob's Knobs Collimation Knobs  
All Original Items  
Very Clean Optics  
Read the Cloudynights.com review of this scope here:  
[http://www.cloudynights.com/item.php?item\\_id=1527](http://www.cloudynights.com/item.php?item_id=1527)

\$750 for all - Local Pickup

Contact Greg McCauley  
IAS Librarian  
317-709-1710  
[gm1727@hotmail.com](mailto:gm1727@hotmail.com)

**For Sale: - Astro-Physics 400 German Equatorial Mount**

Near new condition. Used less than a dozen times.  
9 lb. Stainless Steel Counterweight  
6 lb. Stainless Steel Counterweight  
Wood AP case  
AP Encoders and cables  
NGC-MAX DSC Computer  
\$1700  
Contact: Jim Rinehart 317-881-3475

**For Sale:**

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

Jim Zdobyak  
zobe1@aol.com  
317-862-4715

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**For sale** - 2001 Rexhall-39'6" Motor Home, Like New

Diesel Cummins 330, 35K miles, 2-Slides, New Slide Awnings New Front Tires, Like New Rear Tires, Aluminum Alloy Chrome Wheels, 6-Speed Allison transmission, W/Electric Air brake, Generac Quiet 7.5 KW Generator, Cruise, Tilt & Adjustable height Steering Wheel, Adjustable & Heated Mirrors, 6-Way driver & Passenger Front Seats, In Motion TV Satellite, New House & Coach Batteries, Closet Lights, All Bay Lights, Cherry Wood Trim, Corian Counter Tops, Ice Maker, Double Door Freezer – Refrigerator, 3-Burner Stove & Oven, Convection Microwave Oven, 2- Roof Top A/C with Dual Controls, Floor Furnace, 2000watt Inverter, Master Bedroom with Queen Bed – Recliner Chase Lounge Chair – TV – 2- Bed Vanities, Sleeps – 6, Closets Everywhere, All Cables and Hoses Included, Excellent Shape, 2nd Owner, All Records Kept to Date.

Contact Ralph 317-839-6620 pictures available \$250,000.00 New \$75,000.00 OBO

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### **Equipment Loaner 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. John Molt 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 [philip.dimpelfeld@comcast.net](mailto:philip.dimpelfeld@comcast.net) 812-764-0620

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### **Board Meeting – Board Meeting May 4, 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 Brian P. Murphy on his cell phone 716-8124 or Jeff Patterson 317 506-0325.

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## 2010 Calendar of Meetings

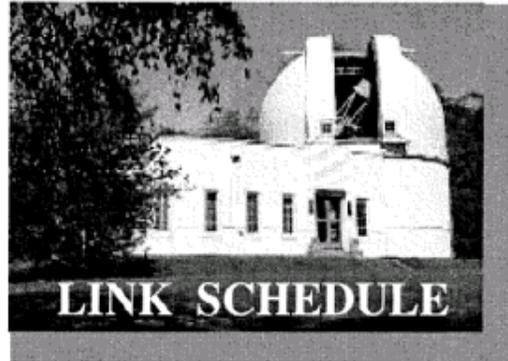
	<b>NAG</b>	<b>General</b>	<b>Board</b>
January		9-Jan	12-Jan
February		6-Feb	2-Feb
March		13-Mar	9-Mar
April	24-Apr	10-Apr	13-Apr
May	22-May	8-May	4-May
June	19-Jun	5-Jun	8-Jun
July	24-Jul	10-Jul	13-Jul
August	21-Aug	14-Aug	17-Aug
September	18-Sep	11-Sep	14-Sep
October		16-Oct	19-Oct
November		13-Nov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

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### Goethe Link Observatory Observatory Address

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

**Observatory 's 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: Gary Schoppenhorst (317)297-1405. DON'T WAIT UNTIL THE LAST MINUTE TO MAKE YOUR REQUEST OR YOU MAY NOT GET ACCESS.*

### **Bulletin Stats**

#### Accessing the Bulletin

The current bulletin can be found on the website [www.iasindy.org](http://www.iasindy.org)

#### **Bulletin - 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

The Bulletin – The monthly publication of the Indiana Astronomical Society

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Greenwood, IN 46143  
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**Membership information**

Contact any IAS officer or the Treasurer John Shepherd (317) 862-3442 or Vicki Switzer  
[vswitzer42@verizon.net](mailto:vswitzer42@verizon.net) 1 812-835-2251

**Link Observatory**

Latitude: 39 degrees, 33 minutes north  
Longitude: 86 degrees, 24 minutes west  
Phone: (317) 831-0668  
IAS Internet address  
<http://www.iasindy.org>

**Executive Officers**

President: Jeff Patterson (317) 300-0449  
Vice-President and Program Director: Doug Brown (317) 872-4050  
Secretary: Betsy Brown 1-317-872-4050  
Treasurer: John Shepherd (317) 862-3442

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John Switzer (2010)	Bill Conner(2012)
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Greg McCauley (2011)	

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**Observatory Manager**

Gary Schoppenhorst 1 317 297-1405

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**Astronomical League Coordinator**

Bill Conner [wmtconner@att.net](mailto:wmtconner@att.net) 1-812 828-0449

**Membership Coordinator**

Vicki Switzer [vswitzer42@verizon.net](mailto:vswitzer42@verizon.net) 1 812-835-2251

### May Calendar, 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4 <b>Board Meeting</b>	5	6 3rd QTR ☾	7	8 <b>General Meeting</b>
9	10	11	12	13 New Moon ●	14	15
16	17	18	19	20 1 <sup>st</sup> QTR ☾	21	22 NAG
23	24	25	26	27 Full Moon ○	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

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: \_\_\_\_\_

For the "membership only" section you need to provide a user name and a password:

User name: \_\_\_\_\_ Password \_\_\_\_\_

List Server - This service is our main communication tool. The list server is accessible only by IAS members and only for IAS related business. It is controlled very carefully to prevent spam. Unless you opt out for the List server, you will automatically have access to it when you are approved for the "members only" section.

I do **not** want to receive IAS communications via the List Server

The Bulletin – The monthly publication of the Indiana Astronomical Society

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.