Indiana Astronomical Society
General Meeting
Saturday, October 12  7:00 PM
Link Observatory

“Radio Astronomy for the Amateur”
Norm Dingle

This will be an introduction to the exciting field of radio astronomy. I will demonstrate that you do not need to have a 50-foot dish in your backyard. By using simple materials, you can actually do simple radio astronomy and contribute to the scientific community and have fun doing it.

Norm Dingle has been interested in astronomy for many years. Since his retirement as a systems engineer, he has been able to pursue the hobby. His primary interests are observing, spectroscopy, and radio astronomy. He also is a licensed amateur radio operator.

Last year Norm was selected by NASA to be a Solar System Ambassador. This is a volunteer program administered by NASA/JPL. The goal of this program is to take the message of NASA, space, and science to the general public.

From the President’s Desk

A change of seasons is in the air though not as apparent by recent weather — dry and hot but it’s helping many of us negate dew on equipment; like observing in the Southwest and we’ve had a couple really spectacular evenings.

I’d like to once again thank all those who made it possible to enjoy the Hog Roast: The Kirsch family for their efforts on another hot day, the volunteers that set everything up, took it down or put away and cleaned up as well as Tom Borlik and Robert Aull who endlessly make improvements and keep the Link Observatory in shape. Thanks also to Indiana University for repair and replacement of sidewalks around Link Observatory and back to Tanager Hill Observatory and they’ve begun to deal with some of the taller trees causing concerns. The Society continues to thrive and grow — member forethought and participation breed new ideas and opportunities; some new things are on the horizon, more on those soon.

Enjoy your passion whatever it may be!

— John Molt
IAS News and Views

IAS Board Candidates Sought

In December, prior to our annual Holiday Party, the IAS will hold elections to fill the Executive Officers and three Board of Directors (BOD) positions. A term on the board is three years and officer terms are renewed annually. Each position involves attending 10 meetings per year where the business of the Society takes place. It’s not a huge commitment of time (board meetings take place immediately prior to our general meeting), and is a great way to further your knowledge and strengthen bonds within the astronomical community.

Please contact Nominating Committee participants Robert Aull (treasurer@iasindy.org), John Molt (president@iasindy.org) or Jeff O’Dair (membership@iasindy.org) if you’re able to help direct and manage the Indiana Astronomical Society.


IAS NEWS

Upcoming Events for October

The following events will occur rain or shine.

IAS Program Planning/Board Meeting

Saturday, October 12 at 5 PM, Link Observatory. The IAS board meeting will occur approximately two hours before the general meeting. IAS members are welcome to attend and provide input.

IAS General Meeting

Saturday, October 12 at 7 PM, Link Observatory. The public is welcome. See the front page of this newsletter for details and speaker information.

Weather permitting, observing will occur with the 36” scope and on the Link grounds after nightfall.

Observing Activities for October

The following events are weather-dependent and subject to last-minute cancellation. Please monitor the IAS Collaboration Site for updates and don’t drive out without confirmation that it’s a “go.”

McCloud Activities (Public event) —

The McCloud Stargaze is the primary public outreach event for the IAS. The final such event for 2019 is scheduled for Saturday, October 5 at McCloud Nature Park in northwest Hendricks County. Directions are available on the IAS web site.

McCloud Coordinator Jon Thomas will begin his presentation in the Nature Center at 8 PM. IAS members bringing scopes are asked to be on-site and set up by 7:45. More details will be provided via our groups.io collaboration site as the date approaches.
Link Observatory Activities (Members and Invited Guests) —

The IAS has deep-sky observing sessions scheduled to occur at Link Observatory on the weekend of October 25-26. Come observe with the telescope operators using the Tanager Hill or Link 36” scopes, or bring your own and set up on the north observing field.

Camping will be permitted if the grounds aren’t too soggy. No trailers or campfires, please.

International Observe the Moon Night October 5

InOMN is an annual event to encourage people to “look up” and take notice of our nearest neighbor. From looking at the Moon with a naked eye to using the most sensitive telescope, every year on the same day people from around the world hold activities that celebrate our Moon.

In 2019, the event will occur on the evening of Saturday, October 5…the same night as the McCloud Stargaze. For members who don’t live in central Indiana, an interactive map displaying local events associated with InOMN is available at http://observethemoonnight.org/.

Observing the Moon is a worthwhile enterprise anytime the weather is clear, and a good observing guide is a big help towards achieving a greater appreciation for the Moon.

Dark Sky Observing Site Information

IAS members may observe at Link Observatory, McCloud Nature Park, Prairie Grass Observatories, West Park in Carmel, Eagle Creek Park, and/or Burkhart Creek Park during non-scheduled times if they do not conflict with reserved activities.

The Link Observatory is open for observing during IAS functions at that location. For scheduled events, see the IAS calendar under the “Events” tab on the website iasindy.org (a monthly calendar is at the end of this newsletter). Impromptu observing opportunities are also occasionally announced on the IAS-Indy collaboration site by our telescope operators. All observing depends on weather conditions, so please join the group to receive the latest information.

For those interested in observing at McCloud Nature Park, call the Nature Center (765-676-5437) or the Park Office (317-718-6188) before 4 PM on the day you want to go. Such impromptu requests are limited to IAS members and their immediate family; other group viewing requires five days’ notice. Please understand that some requests may not be granted depending on event conflicts and the like.

To view at Burkhart Creek County Park, first acquire a copy of the IAS approval letter to show you have permission to be there after dark. Then send an email to both dverley@morgancounty.in.gov and tutterrow8327@att.net, mention that you are with the IAS, and let them know your plans. You may or may not get a reply…don’t worry…just take your approval letter and go.

West Park in Carmel is also available for use by IAS members. Download the MOU from our groups.io files area and print it as proof of membership. You must obtain approval from one of the listed park liaisons at least 24 hours in advance. The Carmel Police Department must also be notified. For liability reasons, non-member guests will have to leave before nightfall. See the MOU for details.

To observe at Eagle Creek Park Eagle’s Crest, first acquire a copy of the IAS approval letter and send an email request to all the addressees provided in the letter to check availability. Upon approval the gate key may be picked up before 5 PM from the administrative office (north side of 56th Street just east of the reservoir). Return the key to the office on the following business day.

For those interested in observing at Prairie Grass Observatory, call Hoppe at 765-296-2753.
**IU Kirkwood Observatory Bloomington**

The Kirkwood Observatory on the IU campus will continue to hold “open house” events through November 6. The Solar Telescope will be open on the first Saturday of each month from 1-3 pm; viewers may even be able to see a solar prominence or two! For nighttime viewing, the 12” refractor will be in use each Wednesday evening.

Please visit the [IU Astronomy Department web site](#) for dates and times. No reservations are required.

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**Hog Roast Digest**

The 2019 IAS Members’ Hog Roast was once again a success! Several people showed up early to set up tables and chairs on the back lawn and to also help Mike Kirsch get the grill going. By five o’clock the swap meet began, with several members hoping to liquidate their extraneous astronomy assets. Most of what seemed to be happening, though, was selling…I didn’t notice much swapping going on. Particularly noteworthy was the Fritz Kleinhans table, where leftovers from the Conner estate were being sold to benefit the IAS.

Acoustic guitar music floated through the air as mealtime drew nearer. There was a peculiar excess of dragonflies patrolling the Link grounds this evening. Although mostly ignored, those few who did seem to notice welcomed it as a form of mosquito control. The oppressive heat and humidity were somewhat mitigated by cloud cover, but I wouldn’t be surprised to hear that the dew point was approaching 70 degrees.

IAS President John Molt welcomed all the members and their families and also made a few announcements.

The actual hog roast dinner commenced at around 6 PM, with an assortment of side dishes and plenty of desserts. The main course consisted of bratwurst and beef franks, pulled pork, sliced tenderloin, and both beef and pork ribs — I didn’t notice any chicken this year, but it certainly wasn’t missed. Special thanks again go to the Kirsch family for hauling down their grill and preparing these meat entrees for us. These folks have stepped up for the Hog Roast year after year, and all too often we take their benevolence for granted. A lot of meat was left uneaten, and lots of pies and cakes, too. Hopefully someone took these leftovers home; thankfully, all my deviled eggs disappeared!

Clean up and tear down also went very well. Many pitched in to get the tables put away in the library closets and the chairs hauled down to the machine shed in preparation for the next public event at Link. Thanks to those who took home a bag or two of trash.
A few photos from the 2019 Hog Roast event. Clockwise from top left: The recently-poured concrete sidewalks, Paula Magar helps the Kirsch’s with food preparation, IAS members enjoying the evening meal, and people queued up in the chow line.

At nightfall, the sky remained all but overcast, and to my knowledge no intrepid observers attempted to get in any viewing. This is probably for the best, as the recently-poured sidewalk repairs would undoubtedly have presented a trip hazard in the dark.

We had 61 people sign up and the actual number of attendees was closer to 45 — the hot and humid weather conditions likely had some bearing on that. Please don’t forget to RSVP next year!

— Bruce Bowman

Observing and Outreach Reports

All IAS members are encouraged to submit their observing reports, whether at IAS events or not!

August 30 (Ft Harrison) — Looks like the weather will not be cooperating with us for the Stargazing event at Fort Harrison State Park. I am calling it a NO GO. The alternate day is Saturday but that doesn’t look much better. Maybe we will luck out but I doubt it.

— Steve Haines

August 30 (DSO night at Link) — Following the lead of Steve Haines and the poor predictions of the clear sky chart, deep sky observing is canceled this evening at Link Observatory.

— Robert Aull
September 7 (McCloud) — With cloud forecasts being inconclusive we were not expecting the best of conditions tonight, so any observing was going to be a good thing. I started my presentation in the nature center at 8:30 and we had a great crowd. Hendricks County Parks was having their volunteer cookout before my presentation so we received some folks from that event stay after. According to Joy, our host naturalist we had 60 people inside and most stayed for stargazing and some others came after the presentation so I’d say we had at least 60 people afterward.

We had nine IAS member scopes or binoculars set up. Those in attendance from IAS I was able to write down were: Jon Thomas (with son Ethan), Norm Dingle, Becky MacKinnon, Allen Ramsey, Sara Farkas (with guest Kelly McCormick), Dan Westfall, Jim Wolford, David Williams, Larry Cates and Phil Thompson. We had quite a few new members attend and I was unable to get all their names (sorry if you’re not listed).

Our skies turned out much better than expected especially up until 10:30. We had a little haze early on as well, but we did have great seeing conditions and Saturn and Jupiter would take quite a bit of eyepiece power which brought some great “wow factor” for visitors. Other objects I focused on were M13, M92, Owl Cluster, Andromeda, Double Cluster, Jupiter and Saturn. Best McCloud stargazing so far this year!

— Jon Thomas

September 12 (Carmel High Planetarium) — Tom Hubbard, John Molt and Ed Rhoads set up telescopes in front of Carmel High School this evening to cap off an Appreciation Night and Planetarium Show for the family and friends of the staff. Reasonable views of Jupiter, its satellites and Saturn but most spectacular was the copper glow of the nearly-full Moon. As always, the younger kids with their unbridled enthusiasm and interesting commentary made outreach quite rewarding.

— John Molt

September 13 (Newfields) — The weather turned out great despite the possibility of rain in the afternoon (which never developed). A cold front pushed the area around 5:00 pm and conditions became almost perfect. Four club members showed up with scopes: Robert Aull, Jim Smith, LeRay Hinchman and Jay and Ruth Simmons.

While waiting for the Moon to rise we viewed Jupiter and Saturn. We had great views of these planets and a number of Newfields patrons took advantage of the opportunity. Robert Aull passed out a number of IAS brochures to those expressing interest in the club. The temperature was perfect with a light breeze. NO DEW which was another great aspect of the evening. A classical ensemble provided live music the entire time.

The full Moon finally made it above the trees around 9:30 pm and many people commented that they had never viewed the Moon through a telescope before. Being full, it was so bright that even with a moon filter it was almost too much for the eyes.

After a number of recent weather-related disappointments it was wonderful to finally get out and see something with a very appreciative crowd of people.

— Jay Simmons

September 14 (Pecar Park) — The Harvest Moon Event at the new Pecar Park just outside of Avon was a great success. We had around 75 people including quite a few IAS attendees with telescopes including Jon Thomas, Fred and Laura Keller, Larry and Kerry Cates, David Howard, Robert Aull, John McShanog, Bruce Bowman, Blake Scheiderer, and John Molt. Many of the IAS people also brought family members and guests, but at least 55-60 of the attendees were non-IAS.
After my presentation inside (and the distribution of Moon Pies), everyone went behind the building to where the scopes were set up. The sky was totally clear and the temperature very comfortable. Most looked at the Moon, Jupiter and Saturn along with some brighter star clusters. I was able to show some folks the Andromeda galaxy. Several people attempted to image the Moon with their cell phones, with varying success. Many were encouraged to attend upcoming IAS meetings or a McCloud stargaze. I offered to help them out with future events at Pecar as well and they all seemed very interested.

By 11 pm virtually all the non-IAS people had left and we began to knock down our scopes and head home. A very nice park at a convenient location and the big tortoises in the Nature Center were a treat, too. It was great to see so many people from both the IAS and the community there tonight! Thanks to Washington Township Parks and Recreation for inviting us.

— Jon Thomas

September 20 (Link Campout) — Steve McSpadden, Dave Collier, and Robert Aull opened the 36" reflector at 2000 hours, with Jim Wolford, Bob Reed, Clay Sappington, Kerry Cates, and Phil Thompson visiting the observing deck during the evening. Between clouds we first observed Jupiter and Saturn; however, as we tried to locate candidates for a two-star alignment the sky became opaque.

Just as we began to consider shutting down, Dave Collier (after closing Tanager Hill Observatory) came up the stairs to report the sky clearing in the east. We decided to stay, performed an alignment, and lady luck smiled, permitting Steve, Dave, Robert and Clay to observe globular clusters M15 in Pegasus and M2 in Aquarius, methane-blue Neptune, M27 Dumbbell Nebula in Vulpecula, M57 Ring Nebula in Lyra, NGC7009 Saturn Nebula in Aquarius, and in Cygnus the blinking planetary nebula NGC6826 plus open cluster M29. Credit goes to Phil Dimplefeld’s Novice-Urban observing list for several of those targets.
By midnight the skies began to cloud up again and we chose to cash in our observing chips.

— Robert Aull

(THO Report) — The observatory was opened at 7:30 pm under partly cloudy skies. Transparency and seeing were variable from bad to average. The following were observing from THO: Larry and Kerry Cates, Phil Thompson, Clayton Sappington, Jim Wolford, Jon Thomas and Bob Reed. Targets observed when we had breaks in the clouds were Jupiter, Saturn, Albireo, and NGC 457 (the “Owl Cluster”). Of note, there was a transit of Io taking place on Jupiter and the moon’s shadow was distinctly visible on the cloud bands.

We did a fair amount of waiting and I am not sure that the 36” was able to get alignment and begin its session during this period. By about 9:15 we were completely clouded over and made a decision to call it for the night. We had THO closed up by 9:30. However, as often happens when we close up, shortly thereafter the overcast breaks. Since the 36” had not completely shut down we made another attempt and by 10:00 we were aligned and observing [again].

— Dave Collier

September 21 (Chatham Hills) — This evening the Indiana Astronomical Society participated in a star viewing evening at “The Club at Chatham Hills.” Mike Newberg, Steve Haines and Greg McCauley supplied telescopes.

What started out looking like a no-go ended up being a surprise success. Skies started out cloudy. Due to this a screen was set up in front of the clubhouse to show a presentation about the Hubble telescope. As if on cue when the show ended the clouds broke up. This allowed views of Saturn and Jupiter. As an added bonus we had a fly-over of the International Space Station.

Attendance was about 25 children and 15 adults.

— Steve Haines

September 27 (Link Campout) — Due to fresh concrete sidewalks being poured this afternoon at Link (see photo at right), there will be no observing session tonight.

Tomorrow we will need to be mindful of tripping hazards during the Hog Roast. The workers will remove the highest obstacles at the end of work today but the wooden forms won’t be removed until Monday.

— Robert Aull

This and That

At the Institute’s public viewing event at the Link observatory last month, Robert Aull successfully completed his certification as an Assistant Telescope Operator under pressure of 93 guests awaiting viewing of the Moon, Jupiter, Saturn and M13.

Congratulations Robert!
October Public Outreach Events

In addition to the IAS-sponsored events that appear in the club calendar, the IAS occasionally fields special requests to educate people on general astronomy or to provide observing opportunities for the public. Becoming involved with these IAS Outreach Programs is a fun and interesting way help individuals and organizations expand their knowledge of Astronomy.

**Saturday, October 5 — Celebrate Science Indiana,** [http://celebratescienceindiana.org/](http://celebratescienceindiana.org/) This is from 9:30-5:00 at the Blue Ribbon Pavilion at the State Fairgrounds. This is a large event with about 4000 attendees and 70 exhibitors. We will probably need 2-3 people to man the IAS table with a couple of telescopes. Our Public Events Coordinator has a conflict and cannot participate, so someone else will have to be the point of contact.

**Saturday, October 5 — Space Day,** Indiana State Museum, 10:00-2:00. The IAS has been invited to participate in Space Day at the Indiana State Museum. Is anyone willing to help out? Probably only need one person with a telescope and astronomy stuff. Again, our Public Events Coordinator is unavailable, so someone else will have to step up.

**Saturday, October 26 — Mounds State Park,** we have a request for a star viewing at this park in Anderson. Just by chance the person who requested this was at the Children’s Museum while I was there. They have several open areas with clear views. We will provide the exact location within the park as the event draws closer.

Please contact the IAS Public Events Coordinator Steve Haines if you are able to help with any of these upcoming events.

Deep-Sky Challenge: Autumn 2019

**Bruce Bowman**

Below please find a list of ten (10) objects to view this season. Those who complete the primary objects will receive a certificate via email and be recognized in the *News and Views*. We’re also providing a challenge object to help push the limits of your observing skills. It’s not necessary to successfully view the challenge object to receive the certificate; we only ask that you try.

Please complete the following list to receive the Autumn certificate:

- NGC7180  Elliptical galaxy in Aquarius
- NGC7184  Spiral galaxy in Aquarius
- NGC7185  Lenticular galaxy in Aquarius
- NGC7252  Barred lenticular galaxy in Aquarius
- NGC7576  Lenticular galaxy in Aquarius
- NGC7585  Lenticular galaxy in Aquarius
- NGC7600  Elliptical galaxy in Aquarius
- NGC7606  Spiral galaxy in Aquarius
- NGC7723  Spiral galaxy in Aquarius
- NGC7727  Barred spiral galaxy in Aquarius

Challenge object for Autumn 2019: NGC7492 in Aquarius

The above objects are all located between 22 and 0 hours of right ascension and are well-placed for evening viewing this season. Please see the article in the September newsletter for more information and observing tips.
**Novice/Urban Observing List – October 2019**

Phil Dimpelfeld

The objects in this month’s observing list lie between the celestial coordinates of Right Ascension = 22h and RA = 0h. This section of the sky includes parts of the zodiac constellations Aquarius and Pisces. The Milky Way runs through the constellations Lacerta, Cepheus, and Cassiopeia. This slice of the sky has only one Messier object – M52.

This month’s list is divided into three levels. The brighter objects, which are relatively easy to find, are in Level 1. The fainter, and more challenging objects, are in Levels 2 and 3. You need only observe 6 objects from any of the levels to qualify for a Certificate of Achievement. Even if you do not have a telescope, being able to identify a double star counts as an observation.

**Level 1**

- **Xi Cephei**, Double Star in Cepheus, 22h 03.8m, +64° 38', mag = 4.4, 6.5, sep = 7.7"  
- **Zeta Aquarri**, Double Star in Aquarius, 22h 28.8m, -00° 01', mag = 4.3, 4.5, sep = 1.8"  
- **Delta Cephei**, Variable/Double Star in Cepheus, 22h 29.2m, +58° 25', mag = (v3.5 – 4.4), 6.3, sep = 41". The primary is the prototype of the famed “Cepheid variables” used as “standard candles” for determining distances; period = 5.4 days.

- **8 Lacertae**, Double (Quadruple) Star in Lacerta, 22h 35.9m, +39° 38', mag = 5.7, 6.5/10.5, 9.1, sep = 22.4/49", 82". Nice blue-white pair. The two fainter companions form a delicate quadruple system with the bright pair. (This one is a challenging star hop!)  
- **94 Aquarii**, Double Star in Aquarius, 23h 19.1m, -13° 28', mag = 5.3, 7.3, sep = 12.7"  
- **Sigma Cassiopeiae**, Double Star in Cassiopeia, 23h 59.0m, +55° 45', mag = 5.0, 7.1, sep = 3"

**Level 2**

- **NGC 7243 (Caldwell 16)**, Open Cluster in Lacerta, 22h 15.3m, +49° 53', mag = 6.4, size = 21.0'  
- **M52**, Open Cluster in Cassiopeia, 23h 24m, +61° 35', mag = 5.0, size = 13'  
- **NGC 7789**, “The White Rose” Cluster, Open Cluster in Cassiopeia, 23h 57.0m, +56° 44', mag = 6.7, size = 15.0'

**Level 3**

- **NGC 7209**, Open Cluster in Lacerta, 22h 05m +46° 30', mag = 7.7, size = 25'  
- **NGC 7331 (Caldwell 30)**, Galaxy in Pegasus, 22h 37m, +34° 24', mag = 10.4, size = 10 × 4'  
- **NGC 7662**, “The Blue Snowball”, Planetary Nebula in Andromeda, 23h 25.9m, +42° 33', mag = 8.3, size = 32 × 28"

**Notes:**

To qualify for the Novice/Urban Observing List, you must observe at least six of the objects. Members are encouraged to find these objects without the use of GoTo so that they become more familiar with the night sky.

If you successfully observe at least six of the objects, please contact Phil Dimpelfeld ([philip.dimpelfeld@yahoo.com](mailto:philip.dimpelfeld@yahoo.com)). Let Phil know how many of the objects you were able to observe. You will be e-mailed a certificate recognizing your accomplishment.
Chill Out: Spot an Ice Giant in October

Most of the planets in our solar system are bright and easily spotted in our night skies. The exceptions are the ice giant planets: Uranus and Neptune. These worlds are so distant and dim that binoculars or telescopes are almost always needed to see them. A great time to search for Uranus is during its opposition on October 28, since the planet is up almost the entire night and at its brightest for the year.

Search for Uranus in the space beneath the stars of Aries the Ram and above Cetus the Whale. These constellations are found west of more prominent Taurus the Bull and Pleiades star cluster. You can also use the Moon as a guide! Uranus will be just a few degrees north of the Moon the night of October 14, close enough to fit both objects into the same binocular field of view. However, it will be much easier to see dim Uranus by moving the bright Moon just out of sight. If you’re using a telescope, zoom in as much as possible once you find Uranus; 100× magnification and greater will reveal its small greenish disc, while background stars will remain points.

Try this observing trick from a dark sky location. Find Uranus with your telescope or binoculars, then look with your unaided eyes at the patch of sky where your equipment is aimed. Do you see a faint star where Uranus should be? That’s not a star; you’re actually seeing Uranus with your naked eye! The ice giant is just bright enough near opposition — magnitude 5.7 — to be visible to observers under clear dark skies. It’s easier to see this ghostly planet unaided after first using an instrument to spot it, sort of like “training wheels” for your eyes. Try this technique with other objects as you observe, and you’ll be amazed at what your eyes can pick out.

By the way, you’ve spotted the first planet discovered in the modern era! William Herschel discovered Uranus via telescope in 1781, and Johann Bode confirmed its status as a planet two years later. NASA’s Voyager 2 is the only spacecraft to visit this strange world, with a brief flyby in 1986. It revealed a strange, severely tilted planetary system possessing faint dark rings, dozens of moons, and eerily featureless cloud tops. Subsequent observations of Uranus from powerful telescopes like Hubble and Keck showed its blank face was temporary, as powerful storms were spotted, caused by dramatic seasonal changes during its 84-year orbit. Uranus’s wildly variable seasons result from a massive collision billions of years ago that tipped the planet to its side.

Discover more about NASA’s current and future missions of exploration of the distant solar system and beyond at nasa.gov

— David Prosper, NASA’s Night Sky Network
Celestial Events for October 2019

05 – The first-quarter Moon occults the planet Saturn for Africa and South America.

08 – The Draconid meteors peak in bright moonlight.

19 – Mercury reaches greatest eastern elongation at 0:41 UTC. This apparition is unfavorable due to a shallow angle between the western horizon and ecliptic.

21 – The Orionid meteors peak in the light of a last-quarter Moon.

25 – The asteroid 9 Metis reaches opposition at magnitude 8.6.

28 – Uranus is at opposition at 8:02 UTC. The 7th planet rises at sunset and is visible all night.

28 – The Southern Taurid meteor shower displays a barely noticeable peak on this date.

31 – A crescent Moon pairs with Jupiter for Halloween.

October Meteor Showers

The Draconids are a minor meteor shower producing only about 10 meteors per hour. It is produced by dust grains left behind by comet 21P Giacobini-Zinner, which was first discovered in 1900. This is an unusual shower in that the best viewing is in the early evening instead of early morning like most other showers. The shower runs annually from October 6-10 and peaks this year on the night of the 8th. This will be an unfavorable year to observe the Draconids because bright moonlight will likely spoil the show. Meteors will radiate from the constellation Draco, but can appear anywhere in the sky.

The Southern Taurids are a long-lasting shower that reaches a barely noticeable maximum on October 28. The shower is active for more than two months but rarely produces more than five shower members per hour, even at maximum activity. The Taurids (both branches) are rich in fireballs and are often responsible for increased number of fireball reports from September through November. The parent object for the Southern Taurids is comet 2P/Encke.

The Orionids are a medium-strength shower that sometimes reaches high activity. In a normal year the Orionids produce 20-25 shower members at maximum. In exceptional years, such as 2006-2009, the peak rates were on par with the Perseids (50-75 per hour). At this time we are unable to predict exactly when the Orionids will be exceptional.

Unfortunately, in 2019, a waning, last-quarter Moon lingers in the sky during the predawn hours of October 22, when viewing would normally be most favorable. The radiant is located above Orion’s bright reddish star Betelgeuse. The source object for the Orionids is comet 1P/Halley.

— Source: American Meteor Society
The Supernova That Destroyed Its Star

Astronomers have discovered a real and unprecedented example of a type of supernova that was until now largely theoretical — a stellar explosion that leaves nothing behind.

In the early universe, stars with a hundred times the Sun’s mass were common. They probably formed in a different way than stars do today — and they died in a different way, too. Modern-day supernovae leave behind a remnant neutron star or black hole surrounded by wisps of stellar leftovers. But those first massive stars ended their lives in total annihilation...

...at least in theory. Now, astronomers think they’ve discovered a real example of such a massive stellar detonation. Sebastian Gomez (Center for Astrophysics, Harvard & Smithsonian) and colleagues report observations of the supernova designated SN 2016iet in the August 20th Astrophysical Journal (full preprint available here), and they argue that it’s the first bona fide pair instability supernova.

Starkiller

When a typical massive star runs out of fuel to burn, its core collapses into something much smaller and more stable — either a neutron star or a black hole. This dense object remains long after the reverse shockwave it sets off has passed through the star’s outer layers, inciting a tremendous explosion.

But when a star has the mass of several dozen Suns, theory says the explosion proceeds a bit differently. The core heats up to such a degree that it forms electrons and their antimatter partners, positrons. Unlike neutrons in a neutron star, electron-positron pairs don’t have any way to support the core against gravity. Instead, the star keeps collapsing. But before it can disappear into the singularity of a black hole, the star’s mass instead ignites runaway fusion that detonates the entire star. This is what astronomers call a pair-instability supernova.

But until now, it’s been a largely theoretical idea. A few candidates have been observed — some of which we’ve previously reported on, such as 2007bi and ASASSN-15lh. But astronomers weren’t able to glean enough information about those stars’ pre-explosion mass and other properties.

Far from Home

SN 2016iet is different. Astronomers were able to collect immediate observations when an automated system discovered the supernova in Gaia images. Automated observations by the Catalina Real-Time Transient Survey and the Pan-STARRS Survey for Transients also spotted the supernova in January 2017 and March 2017, respectively.

These observations already demonstrated that the explosion likely hadn’t left any remnant behind. They also showed that the exploded star was isolated, lying an incredible 54,000 light-years from its tiny dwarf galaxy host. Intrigued, the team followed up by taking spectra of the supernova in April 2017 through the Magellan Baade 6.5-meter Telescope in Chile, as well as through several other ground-based telescopes over the next several years.
The discovery image (right) shows SN 2016iet and its most likely host galaxy. It was taken with the Low Dispersion Survey Spectrograph on the Magellan Clay 6.5-m telescope at Las Campanas Observatory on July 9, 2018.

The initial spectrum showed no hydrogen, so the astronomers classified the supernova as a Type I. They also measured its distance, showing that its light had traveled almost a billion light-years to Earth. But the object’s properties don’t fit any other more detailed classification — in fact, it doesn’t resemble any other known supernovae, period.

“When we first realized how thoroughly unusual SN 2016iet is, my reaction was ‘Whoa – did something go horribly wrong with our data?’” Gomez says.

The astronomers took images through multiple ground-based telescopes, following the supernova’s light as it faded. This light curve was crucial for testing various explanations of the blast. The team concludes that before it exploded, the hefty star had between 55 and 120 Suns’ worth of mass, though it was probably born with 200 times the Sun’s mass. Although it probably lost some of its outer layers throughout its lifetime, about a decade before it went kabloom, the star might have started casting off mass at a higher rate, about three solar masses per year.

Moreover, the environment around the destroyed star doesn’t have many elements heavier than hydrogen and helium (in other words, it has a low metallicity). That suggests that the star was born and died in a relatively pristine area that hadn’t changed much since the Big Bang. In other words, in both its mass and environment, the star was similar to the universe’s first stars — and that puts it in the right range of pair-instability supernovae.

“This is the first [supernova] for which we are able to measure the mass and metallicity of the progenitor, and see they are consistent with theoretical expectations,” Gomez says.

“The idea of pair-instability supernovae has been around for decades,” adds coauthor Edo Berger (Harvard University). “But finally having the first observational example that puts a dying star in the right regime of mass, with the right behavior, and in a metal-poor dwarf galaxy, is an incredible step forward.”

— Monica Young, Sky & Telescope. Used with permission.
A “Super Sprite” Over China

You never know what you might see in the wake of a big storm. On August 25th, Chinese astrophotographer Chao Shen of Shaoxing City went outside to photograph the Milky Way. A typhoon named “White Deer” had passed through the day before, and the storm clouds were parting. “I saw the stars — but that’s not all,” says Shen. “A Gigantic Jet leaped up right before my eyes!”

Gigantic Jets are lightning-like discharges that spring from the tops of thunderstorms, reaching all the way to the edge of space. They’re related to sprites, but larger and more powerful.

“Shen definitely caught a Gigantic Jet,” confirms Oscar van der Velde of the Lightning Research Group at the Universitat Politècnica de Catalunya. “It looks like it may have reached as high as 90 km above the ground.”

“Gigantic Jets are much more rare than sprites,” says van der Velde. “While sprites were discovered in 1989 and have since been photographed by the thousands, it was not until 2001-2002 that Gigantic Jets were first recorded from Puerto Rico and Taiwan.” Only dozens of Gigantic Jets have ever been photographed.

Shen says that “the Jet came from a storm about 100 km southwest of me. It was so huge, I was able to see it clearly despite the distance.”

Observers of sprites may be wondering if Shen really saw this jet. The answer is “yes.” Unlike
sprites, which flicker so rapidly that they are difficult to see with the unaided eye, Gigantic Jets can last for hundreds of milliseconds, long enough for human eyes to register their purple glow.

Gigantic jets are part of a growing menagerie of strange forms that appear above intense thunderstorms, including sprites, elves, trolls, and blue jets. Some researchers believe that cosmic rays help trigger these “transient luminous events” by ionizing the air in and around thunderheads. If so, now is a good time to look for Gigantic Jets, because cosmic rays are nearing a Space Age high.

Thank you, Solar Minimum!

— Dr Tony Phillips, Spaceweather.com

**Mike Downs’ Sketchy Nighttime Activities**

As an alternative to imaging, IAS member Mike Downs continues to sketch a variety of DSOs from his favorite viewing locations in Florida. Provided below are a few more examples of his astro-art.

According to Mike: “Clouds continue to be the norm at night down here but there have been a few chances to observe. I’ve included a few drawings that I have not posted on the Facebook page should you need any material for the newsletter.

Have a good time at the Hog Roast!”

Those wishing to follow Mike’s lead might be interested in participating in the Astronomical League’s Sketching Observing Award. More details at [https://www.astroleague.org/programs/sketching-observing-award](https://www.astroleague.org/programs/sketching-observing-award)
Public Outreach Programs
To schedule a program at the Link Observatory or at your site, please contact the following people:

Public Outreach Programs: To schedule a public event, contact the IAS Events Coordinator Steve Haines by sending an email to events-coordinator@iasindy.org.

Goethe Link Observatory tour: To schedule a tour of the Link Observatory, contact Link Observatory Manager John Shepherd by email at link-observatory@iasindy.org.

Equipment Loan Program
Did you know you could borrow a scope or piece of astronomy equipment from the Society and take it for a test drive? Members trying to determine what kind of equipment to buy are welcome to borrow one of the Society’s scopes for a month or two and see how they like it. Larry Cates is the program coordinator and can arrange for pickup and training. We will also consider donations of equipment appropriate for this program. The IAS is a public charity under section 509(a)(2) of the internal revenue code. We would be happy to provide acknowledgement suitable for documentation as a tax deduction.

The Equipment Loan Coordinator may be contacted at equipment@iasindy.org

Astro Ads
Do you have or are you looking for astronomy-related materials and equipment? The IAS, as a service to its members, will publish non-commercial ads at no charge. For sale, exchange, or want ads are all accepted. Each ad runs in the newsletter for four months and may be renewed at the owner’s request.

To place an ad, send an email to editor@iasindy.org.

For Sale:
GSO 8x50 straight-thru finder with dovetail holder, unused: $45
Orion 6x26 straight-thru correct-image finder with dovetail holder, unused: $20
Telrad base, unused: $5
Secondary spider, 3-vane, for approx 10-11 inch tube. Came off my 8-inch dob I am rebuilding: $25
Novak 8-inch mirror cell: $125
Photos available at https://iasindy.org/tmp/Utz.zip. Contact Greg Utz rogue00engineer@gmail.com.

For Sale:
8” Celestron SCT for sale. The mount is the new advanced VX and two years old, but needs a firmware upgrade. The OTA is the old orange one. Comes with a dew shield (not powered) and eyepieces. No GPS unit or power pack. A photo is available at https://iasindy.org/tmp/DWScope.jpg. Asking $600. Contact Dan Westfall dawestfall@juno.com.

For Sale:
8” Celestar SCT. Several extras included, email for details. Asking $460. Contact Ron Burgess RFPLBurgess@aol.com.
IAS News and Views

IAS Membership Report for August 2019

On 8/31/2019 the IAS had a total of 229 members.

During August there were 13 renewals and 14 new memberships.

The IAS welcomes the following new members:

Harry Gundrum  New Palestine
Frank Seger     North Salem
Rebecca Mackinnon North Salem
Damien Shelton  Avon
Sheldon Pratt   Bloomington
Peter Merritt   Bloomington
Allen Ramsey    Mooresville
Sundaram Raghuraman Carmel
Brian Tucker    Brownsburg
David Rose      Indianapolis
Tom Parker      Martinsville
Robert Reed     Indianapolis
David Breece    Indianapolis
Sara Farkas     Indianapolis

Submitted by Jeff O’Dair, IAS Membership Coordinator

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<th>Deep-Sky</th>
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<td>12 (holiday party)</td>
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NOTES:
The April-October general meetings will be at Link. The remainder will be at Holcomb.
IAS board meetings will be held two hours prior to the general meeting at the same location.
Deep-sky observing sessions are at Link. Overnight camping is allowed, but no trailers or campfires.
*Transit of Mercury event  TBD – to be determined
Miscellanea

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

Training programs are scheduled by the Observatory Manager as instructors are available and time permits, although other requests can override these sessions.

To schedule the use of the 36" telescope, two criteria must be met:

- There must be a trained telescope operator and at least one assistant present.
- Send an email to the Observatory Manager (link-observatory@iasindy.org) to confirm availability.

*Please plan ahead! Last-minute scheduling requests may not get access.*

IAS News & Views — The monthly newsletter can be found on our web site at iasindy.org. The News and Views welcomes articles of local astronomical interest, follow-up on IAS events, and want/for sale ads. Please submit articles to the editor in an email to editor@iasindy.org.

Membership information — Please send an email to membership@iasindy.org; our membership coordinator will respond promptly. Full instructions are also available under the “Join Us” tab on our web site, where you can submit a paperless membership form, e-pay your dues, join the Astronomical League, and/or make a donation.

Requests for Information — You may contact our officers, Board members, and Coordinators via our website at iasindy.org. Place your cursor on the “Home” tab and then select “Contact us.” Page down to the person you desire to contact and send an email message requesting information or a return telephone call. We will be happy to respond within a reasonable time frame.

Logo Clothing — The IAS has a supply of logo ware using Mid-Central Trophy in Kokomo, IN. Typically T-shirts, sweatshirts, polo shirts, and caps are available. Call Linda (765-453-5494), tell her this is an order for the IAS logo ware, discuss what you want and give her the size. She can determine the cost and shipping and mail the order directly to your home. All major credit cards are accepted.

Astro-Quote:

“Whoever is careless with the truth in small matters cannot be trusted with important matters.”

— Albert Einstein
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The Iris Nebula, aka NGC 7023, in Cepheus. Photo courtesy Scotty Bishop.

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