REFLECTIONS / REFRACTIONS

University Lowbrow Astronomers

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The "Field of Heaven"

By Doug Scobel

Here's a little quiz. What consists of 92.6% iron, 6.7% nickel, 0.4% cobalt, 0.3% phosphorus, and trace amounts of other elements? I'll give you a hint – the Lowbrows own three pieces of it. Give up? It's the Campo del Cielo meteorite. More accurately, the meteorites from the Campo del Cielo meteorite field in Argentina.

While looking through some of the treasurer's paper records I stumbled across three little meteorites that we had apparently acquired from Astronomy magazine. Each one was packaged in its own little bag with an informative fact sheet. Here's what each one says:

"This meteorite landed 4,000 to 6,000 years ago. Its name, taken from the where the meteorite fell in northern Argentina, means Field of Heaven in Spanish. The meteorite contains 97% iron, 6.7% nickel, 0.4% cobalt, 0.3% phosphorus, and tiny amounts of additional elements. Its mineral structure is that of a poly-crystalline coarse octahedrite."

The Lowbrows' three meteorites ***Photos courtesy of the Author***

Curious to learn more, and to find out what their actual composition is (Astronomy's questionable math notwithstanding), I did a little bit of research on the web.

Indeed, the Campo del Cielo meteorite field lies about 1000 kilometers northwest of Buenos Aires, Argentina, in the provinces of Chaco and Santiago del Estero. The debris field is some three by twenty kilometers in size, perhaps larger, and contains at least 26 craters. The largest crater has dimensions of 115 by 91 meters, and its age is estimated at 4,000 to 5,000 years.

The meteorite was discovered in 1576 by an Argentine governor during an expedition to see where local natives known as the Mocoví were getting the iron for their weapons. The expedition team found a large mass of metal protruding from the ground. The Mocoví claimed that the mass fell from the sky. They called the place "Piguem Nonralta", which the Spanish translated as "Campo del Cielo" - "Field of Heaven" in English. After the expedition brought back a few samples, and they were found to consist of unusually pure iron, curiously the discovery was quickly forgotten.

NOTE: Our regular meeting room, G115 Angel Hall, was flooded in June. Check your email for the location of the August 21 meeting.

Nearly 200 years later the mass was “rediscovered”, starting in 1774 by don Bartolome Francisco de Maguna, and later in 1783 by Rubin de Celis. The largest mass discovered at that time was estimated to weigh more than 15 metric tons (1 metric ton, also known as a tonne, is 1,000 kilograms, or about 1.1 U.S. tons). Later analysis of samples showed that they consisted of about 90% iron and 10% nickel, so they were classified as being of meteoric origin. Curiously, the find was again considered worthless, and the site was abandoned. Alas, the location of this particular fragment (if you can call something that weighs more than fifteen tons a fragment) is no longer known.

But it was not long afterwards, starting in the early 1800’s, that exploration of the site began anew, this time for good. More and more fragments were being discovered, and the discovery of more pieces continues pretty much to this day. The largest piece found so far is named “el Chaco”, with a mass of 37 metric tons. It was discovered in 1969, but it was 1980 before it was extracted from where it had rested for more than 4,000 years.

The second largest fragment, named “la Sorpresa”, was discovered in 2005 and weighs in at fifteen metric tons. The entire field (at least 60 square kilometers) is strewn with meteorites. At least two of the craters contained thousands of small pieces of the cosmic traveler. The distribution suggests that a large body, estimated to be four or five meters in diameter or even larger, entered the atmosphere at a shallow angle, and broke up before hitting the ground. Assuming all the fragments originated from one body, the total mass of the fragments found so far (more than 80 metric tons not counting the lost Mesón de Fierro) makes the Campo del Cielo meteorite the most massive recovered so far on Earth. Carbon dating of charred wood found under the larger fragments puts the fall at 4,200 to 4,700 years ago.

The following table shows the most up-to-date list I could find of known Campo del Cielo fragments with a mass greater than 200kg:

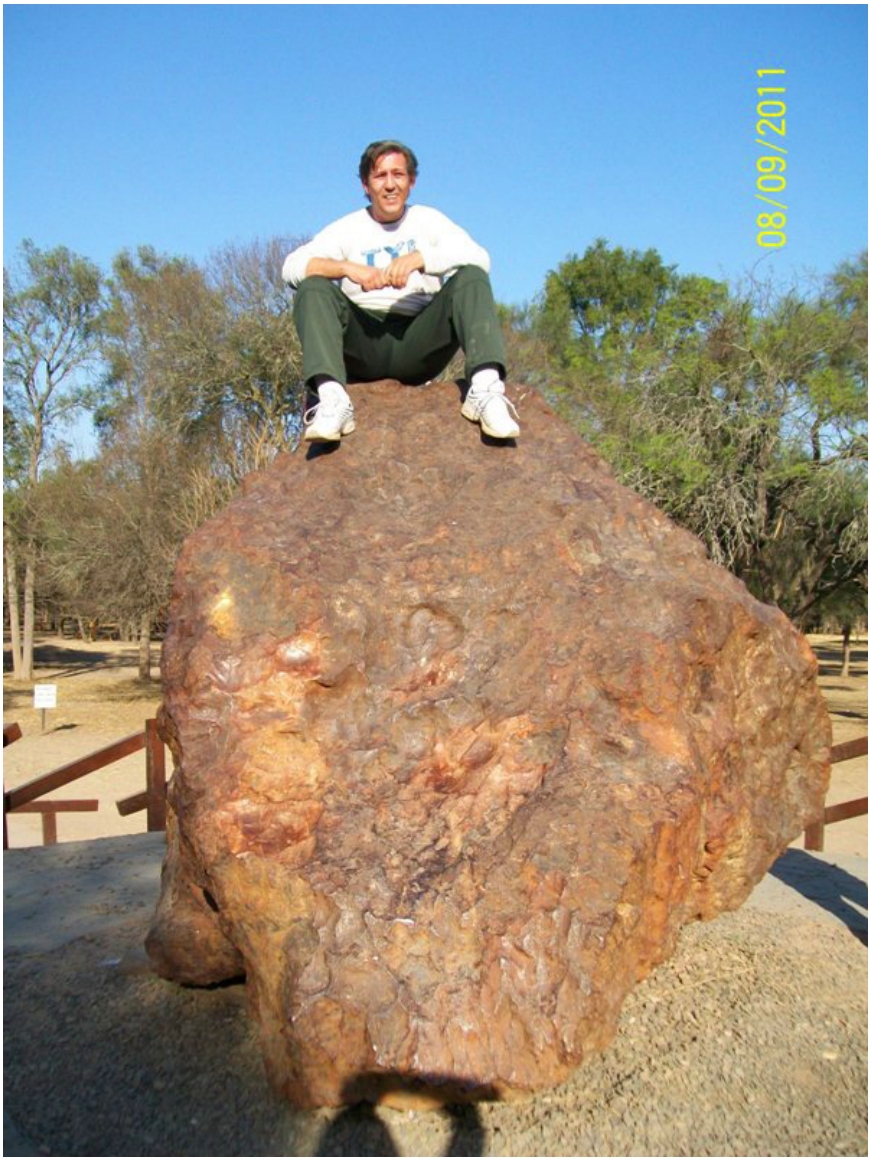
Name	Mass	Year Discovered	Location
Mesón de Fierro	15 tonnes	1576	Lost. This was the first specimen discovered by the Spanish military.
Runa Pocito	750 kg	1803	British Museum, London, United Kingdom
El Toba	4210 kg	1923	Museo Argentino de Ciencias Naturales (MACN), Buenos Aires, Argentina
El Mocoví	732 kg	1925	MACN, Buenos Aires, Argentina
El Tonocote	850 kg	1931	Planetarium, Buenos Aires, Argentina
El Avipón	460 kg	1936	MACN, Buenos Aires, Argentina
El Mataco	998 kg	1937	Museo Provincial, Rosario, Santa Fe, Argentina
El Patio	350 kg	before 1960	Estancia El Taco, Chaco, Argentina
El Taco	1998 kg	1962	Main mass at National Museum of Natural History, Smithsonian Institution, Washington, DC; 600 kg mass at Planetarium of Buenos Aires, Argentina
La Perdida (1)	1625 kg	1965	Planetarium, Buenos Aires, Argentina
La Perdida (2)	3370 kg	1965	Still in the crater
El Chaco	37.4 tonnes	1969	Gancedo, Chaco, Argentina. El Chaco is the second heaviest meteorite on Earth.
NO NAME	10 tonnes	1997	Near its find site, Chaco, Argentina
La Sorpresa	15 tonnes	2005	Chaco, Argentina
el Wichí	7.65 tonnes	2006	???

Sadly, there have been several attempts by some unscrupulous sorts to steal or illegally acquire some of the Campo del Cielo meteorites. There was even an attempt to steal the 37 ton el Chaco! In 1990 a famous American meteorite hunter, with assistance from some locals, tried to make off with it. I’m not sure what logistics are involved in trying to steal something that weighs almost 40 tons, but it happened.

Fortunately, local authorities foiled their attempt. The better news is this event sparked a local movement that in 1994 culminated in a series of provincial laws to protect the larger specimens. More than a dozen of the large meteorites are now on display at various locations in Argentina and other countries. But even today, the meteorites in the field are not safe. As recently as May 31, 2015 the BBC posted a story reporting that Argentine police arrested four men who were apparently attempting to steal more than a ton of the Campo del Cielo meteorites. They found more than two hundred large meteorites under the seats of their truck during a random stop! It makes me wonder how much of the meteorite is disappearing and being sold illegally under false pretenses.

So how did we come to acquire these three little pieces from the sky? Former Lowbrow treasurers tell me that they were some kind of promotional items from Astronomy magazine. Each piece weighs in at a mere three grams, and they are pretty small. Considering the number of fragments found so far, I'm guessing that they are probably not worth a lot of money. So it's not a huge surprise to me that Astronomy magazine felt that they could afford to give them away. But still I was surprised to "discover" them in our collection of treasurer's materials. They are pretty amazing to look at when you consider their extra-terrestrial origin.

If you want to learn more about the Campo del Cielo meteorite field, a casual Internet search will yield several web sites providing much more detail than I can describe here.



El Chaco, the largest fragment of the Campo del Cielo meteorite found thus far. It weighs in at a mass of more than 37 metric tons! ***Photo courtesy Scheihing Edgardo.***

Many of the web sites also provide opportunities to purchase meteorites. Because I really don't want to try to discern between those sites that are on the up-and-up and those that are not, I thought it best if I didn't list any here. If you are curious you can look for yourself.

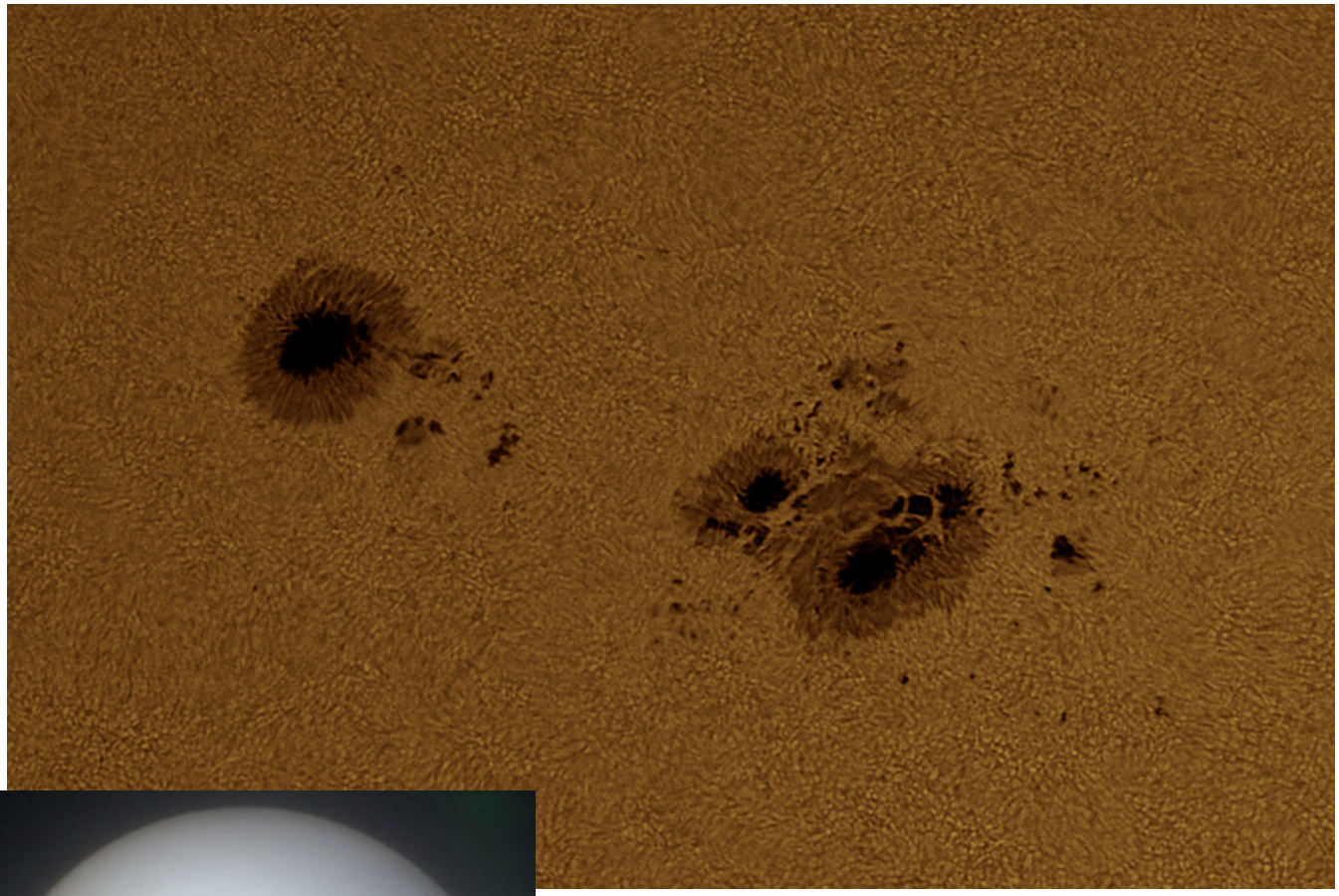
I will be bringing the meteorites with me to upcoming meetings, so if you'd like to take a look at our three little pieces of the "Field of Heaven" just ask.

Our three little pieces weigh in with a total mass of nine grams, and as you can see easily fit in the palm of one's hand.

From 93,000,000 Miles (give or take)

Lowbrows Brave Coronal Mass Ejection!!!

June 22 the sun hurled a mighty blast of plasma toward the earth. Intrepid Lowbrows Roy McCullough and Chris Sarnecki erected their equipment to provide shots of Sunspot 2371.--Ed.



Above: "The Ohio connection imaged sunspot 2371 today (June 23) with our 5 inch f22 scope using a point grey grasshopper express camera (400 images stacked) and a Herschel wedge." Photo: Roy McCullough

Left: Chris Sarnecki's effort with more modest equipment. "Just looked at the Sun through my 8-inch, f5.9 (stopped down to a 3-inch, f15.7) with a low power eyepiece yielding about x18 power, with a Mylar solar filter."

Inset: Manipulated in Photoshop to enhance detail by the editor.

My Auroral Experience

By Brian Ottum

Because I received a “biggest solar storm in a decade” email, AND I saw a nice white flare amidst a sunspot group the morning of June 23 in the H/alpha scope, AND the weather was great, AND the moon was not totally bad, AND I know that we are on the down slope for solar activity, AND I had the free time, I drove north to Port Crescent State Park yesterday at 3 PM. at the tip of Michigan’s Thumb. It took me 3 hours,10 minutes from Saline, in my RV. There are no direct highways, which is both good and bad.

Sunset was fantastic. I set up on the beach, but the wind was straight in and steady. Wife and her friends showed up at 11:45 PM. We could see some of a green glow, but not much until 12:50 when the moon set (which was very cool, over the distant horizon). In dark skies, we could see a lot of subtle activity, at the perfect north horizon (over Lake Huron). It was very cool to see areas brighten and move, almost at the limit of detection. Occasionally, there were pinkish spikes, but they were rare.

All in all, not great. But my camera is more sensitive than my eye, so attached is a representative shot. I hope to make a time lapse of the movement of the greenish aurora patches (from right to left).

We packed up at 3:00 AM. The wife’s friends are young so they drove back to Novi! We camped at the Port Crescent campground, had coffee at the beach, lunch in Port Austin, then came home.

ON THE OTHER HAND, Port Crescent State Park remains a FANTASTIC dark sky spot. See the attached milky way

shot – a single 25 second image!

I highly recommend bringing scopes up there to observe.

The “Day Use Area” parking lot is ours to use. Wide open skies, protected from the wind by dunes. They do not lock the gate, despite menacing signs that purport to do it at 10pm. It is an official “dark sky” preserve. Unfortunately, they do lock the bathrooms at 10pm (we could ask for a one-time change in that policy, I suggest). The state park campground is 2 miles to the north, and a low-priced motel & restaurant (frequented by the Toledo club members) is ½ mile away.

If the weather looks good, I will be back up there for the Perseid Meteor Shower.

The Perseid Meteor Shower *is expected to peak the night of August 13/14 (Thursday/Friday). This is our most reliable meteor shower of the year. The peak of 60-100 meteors per hour is expected about 2:00-4:00 AM on Friday the 14th. (The radiant will be about 40 degrees up in the northeast.) There is increased activity for 2-3 days either side of the peak, so get out whenever you can. The moon is just shy of new, so if the weather cooperates, observers at a reasonably dark site (Peach Mt. works, but darker is better) should have a good show most of the night.*

Observing meteors is pretty simple: All that is needed is a pair of eyes, and something to lie on. Oh, one last thing--look up!

Sidewalk Astronomy on Ashley Street

Jupiter and Venus *were in conjunction from June 28 to July 2. This rare event inspired several Lowbrows to set up in downtown Ann Arbor and share viewing the two bright planets with whomever of the public happened to stroll by. The weather was cloudy all week, but cleared on Thursday the 2nd with the two planets just over one degree apart as the sun was setting.*

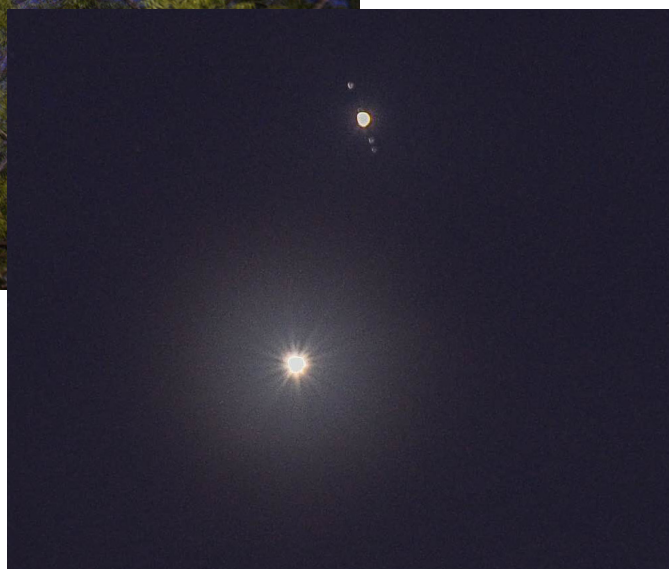
Mike Radwick coaches a young astronomer as she looks through a small refractor. John Causland must have gotten an amazing view through his image stabilized binoculars to give him that big a grin. Tim Kasseliz looks on.

Photos courtesy John Causland

Mike Radwick points to where Jupiter and Venus are in the sky. Dave Snyder (on the right in the Lowbrow sweatshirt) answered questions and passed out the club's flyers.

And what were they all looking at??? (turn to page 8)

Above: Jupiter and Venus in fading twilight from South Ashley St., Ann Arbor, July 2.
Photo: John Causland



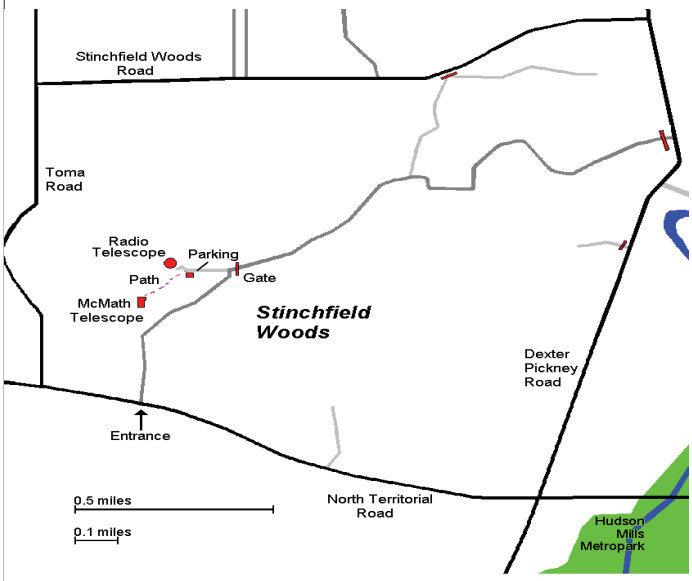
Not all Lowbrows had lousy skies for the conjunction as these photos by Dylan Ma show. But going to India is a bit extreme.

"I saw the conjunction for at least a full week and photographed it from India.
Attached is a photograph I took of the conjunction at 28 mm from Monday, June 29th, and a telephoto image at 300 mm (and cropped) from Tuesday, June 30th."

Places & Times

Monthly meetings of the University Lowbrow Astronomers are held the third Friday of each month at 7:30 PM. The location is usually Angell Hall, ground floor, Room G115. Angell Hall is located on State Street on the University of Michigan Central Campus, between North University and South University Streets. The building entrance nearest Room G115 is the east facing door at the south end of Angell Hall. A club observing session at the Peach Mountain Observatory, weather permitting, often follows the meeting.

Peach Mountain Observatory is the home of the University of Michigan's 25 meter radio telescope as well as the University's McMath 24" telescope, maintained and operated by the Lowbrows. Located northwest of Dexter, MI; the entrance is off North Territorial Road, 1.1 miles west of Dexter-Pinckney Rd. A maize and blue sign marks the gate. Follow the gravel road to the top of the hill to a parking area south of the radio telescope, then walk About 100 yards along the path west of the fence to reach the McMath Observatory.



Public Open House / Star Parties

Public Open Houses / Star Parties are generally held on the Saturdays before and after the New Moon at the Peach Mountain observatory, but are usually cancelled if the sky is cloudy at sunset or the temperature is below 10 degrees F. For the most up to date info on the Open House / Star Party status call: (734)332-9132. Many members bring their telescope to share with the public and visitors are welcome to do the same. Peach Mountain is home to millions of hungry mosquitoes, so apply bug repellent, and it can get rather cold at night, please dress accordingly.

Membership

Membership dues in the University Lowbrow Astronomers are $30 per year for individuals or families, $20 per year for students and seniors (age 55+) and $5 if you live outside of the Lower Peninsula of Michigan.

This entitles you to the access to our monthly Newsletters on-line at our website and use of the 24" McMath telescope (after some training).

A hard copy of the Newsletter can be obtained with an additional $18 annual fee to cover printing and postage. Dues can be paid at the monthly meetings or by check made out to University Lowbrow Astronomers and mailed to:

The University Lowbrow Astronomers

P.O. 131446

Ann Arbor, MI 48113

Membership in the Lowbrows can also get you a discount on these magazine subscriptions:

Sky & Telescope - $32.95 / year $62.95/2 years

Astronomy - $34.00 / year or $60.00 for 2 years

For more information contact the club Treasurer at:

lowbrowdoug@gmail.com

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest.

Call or Email the Newsletter Editor: **Jim Forrester (734) 663-1638 or** jim_forrester@hotmail.com to discuss length and format. Announcements, articles and images are due by the 1st day of the month as publication is the 7th.

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Lowbrow's Home Page

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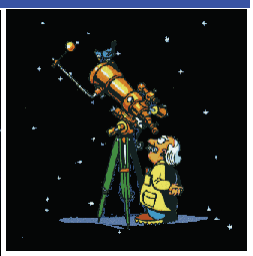
Reflections & Refractions



Website
www.umich.edu/~lowbrows/

Venus - Jupiter Conjunction. Taken with a Canon SX160 IS from Novi on Thursday evening, 02 July 2015. ***Jim Abshier***

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