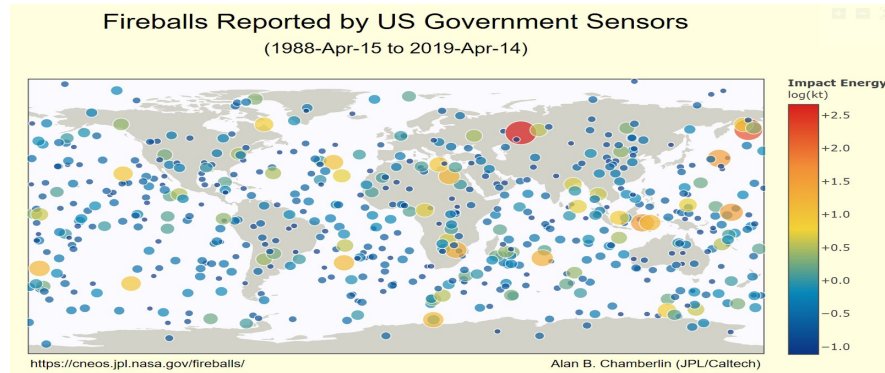


## Meeting Minutes 4/19/19

- **ATOMM:** In Parker Library (across from N305) from 2-4pm. We're yeeking our last haws as the end of the semester draws near, prepare for finals lads.
- **TIMESTEP:** The next meeting will be on April 24th in N305
  - Reading Journal Papers with guest lecturer Dr. Carlos Vargas:
    - Prepare for your summer (or any!) research positions by learning how to read academic journal papers.
- **Don's Question of the Week:**
  - In the news: (BBC Article) Only one in 50 people have nights free from light pollution, how did they determine this?
    - The work, carried out for the Campaign to Protect Rural England (CPRE), suggests the situation has not improved since it raised the issue 12 years ago.
    - The self-selecting survey asked 2,300 people to count the stars in this constellation as a measure of light pollution in their area.
    - More than half the people taking part said they couldn't see more than 10 stars in the constellation Orion.
    - Just a 10th of people could count up to 30 stars, whereas the Royal Observatory in Greenwich says that up to 40 could be visible to someone with a sharp eye on a clear night. (uh.....no?)
    - Only 2% of participants had truly dark skies which allowed them to see more than 30 stars.
    - That's half the level of the previous Star Count in 2014.
  - In the news: A 2014 meteor may have come from another solar system
    - It sure is 2019, how in the heck would someone remember seeing a "2014 meteor" 5 years later, and know that it came from another solar system?
    - CNEOS (Center for Near Earth Object Studies) Catalog: A "bolide" (fireball) recorded by US government sensors
    - Event details:
      - 2014-01-08 17:05:34 UTC
      - northern coast of Papua New Guinea



■ **Event details:**

Peak Brightness Date/Time (UT)	Latitude (deg.)	Longitude (deg.)	Altitude (km)	Velocity (km/s)	Velocity Components (km/s)			Total Radiated Energy (J)	Calculated Total Impact Energy (kt)
					v <sub>x</sub>	v <sub>y</sub>	v <sub>z</sub>		
2014-03-03 15:00:21	29.0S	94.9W						9.4e10	0.29
2014-02-18 12:50:44	32.8S	61.5W						2.6e10	0.092
2014-02-13 06:47:42	13.3N	110.7W	25.0					63e10	1.5
2014-01-15 02:46:19	18.5S	141.8E	29.6					14.0e10	0.41
2014-01-12 16:00:48	2.9N	64.4E	37.0	16.2	-5.2	-15.1	2.6	7.8e10	0.24
2014-01-08 17:05:34	1.3S	147.6E	18.7	44.8	-3.4	-43.5	-10.3	3.1e10	0.11

- Can determine orbital/impact properties (velocity of meteor), if it's greater than 42km/s, it's not from our solar system!
- Pre-impact heliocentric velocity = ~60 km/sec
- *"We find that the meteor was unbound with an asymptotic speed of  $v_{\infty} \sim 43.8$  km/sec outside of the solar system. In order for the object to be bound, the observed speed of  $v_{obs} = 44.8$  km/sec would have to be off by more than 45%, or 20 km/sec."*
- The origin is towards RA 3:24 and DEC +10.4.
- From impact energy, they calculate mass
- Assume a density -> ~1 m diameter
- From the catalog's detection rate: we approximate the yearly detection rate of interstellar meteors to be at least ~0.1 per year
- Number density of such objects  $\sim 10^6$  AU<sup>-3</sup>
- Our discovery also implies that at least  $4.5 \times 10^8$  similarly sized interstellar bolide events have occurred over Earth's lifetime.
- Potentially, interstellar meteors could deliver life from another planetary system and mediate panspermia.
- This is not the first time astronomers have gone looking for interstellar meteors, says astronomer Eric Mamajek, who isn't convinced that the 2014 find is the real deal.
- *"The result is interesting, but rests upon measurements for a single event. ... Was the event a statistical fluke or an actual interstellar meteor? The answer seems to lie either with inaccessible government sensors or in a fine rain of pulverized dust that fell over the Pacific."*
  - Dr. Eric Mamajek (JPL)

- **Astronomy News of the Week:** The big news is the black hole reveal, we can't top that.
  - Don't forget to sign up for Astro News of the week this semester!
- **Active Galactic Videos:** Checking Out the Books that Changed Astronomy
  - A new video all about Special Collection books!
  - Featuring our very own Dr. Don McCarthy
- **Star Parties:** We have one on:
  - April 25th at Donaldson Elementary
    - We're all good for this one!
  - April 30th at Wyndam Grand Resort and Spa from 6-8pm
    - Need ~ 1 more person! Will be doing solar observing, please volunteer if you can!



- **T-Shirt Update:** They have arrived.
- **Laser Fun Day:** On April 20th from 10am-3pm, free food and Tshirt if you volunteer! Really cool
- **Astronomy Club Internal Symposium:** Today in N210 after the club meeting! People will be giving 5-10 minute talks about their research, and there will be pizza!
- **Spanish-Speaking Translators Needed!**
  - Steward will be holding a public talk on April 29th from 7:30pm to 9:30pm
  - People fluent in Spanish are needed to help translate information from telescope operators
  - For more information, email:
    - rehviding@email.arizona.edu
- **Dead Day Breakfast:** Will be on May 2nd at 10am. Astroclub will provide bagels and coffee as usual. If you're able to bring a breakfast food to share, please do! The sign up sheet is out!

- **Astronomers:** We protect, we attack, but most importantly, we snack. The Astro Club snack store is restocked every week. And it's open to everyone, including faculty. Honor system payment.
- **Need end of semester pictures!** Please upload cool pics you've taken with astronomy club to the folder online!
- **Astronomy Majors Lounge:** If you're an astronomy major, you can use this lounge for all your lounging and soup needs!
- **Pay your dues!** \$10 each semester, funds for trips, snacks, cool activities, shirts, etc.