

Web Chat: Stay 'Up All Night' to Watch the Perseids 2014!
Experts Dr. Bill Cooke, Danielle Moser and Rhiannon Blaauw
August 12-13, 2014

Brooke_Moderator: Hi everyone, and welcome to the chat. Our experts are finalizing their prep and will start taking questions in about 10 minutes. Thanks for being here tonight!

Brooke_Moderator: Just a few more moments, everyone, and our chat will get started. We're seeing a good number of meteors in our Ustream feed -- we may get a very nice show tonight!

Brooke_Moderator: And...here we go. Our experts are ready for your questions. Let's talk Perseids!

Eow: When you say local time is it local time of Huntsville, Alabama ? or Pacific time ? The time mentioned is so misleading ! I hope you dont keep people all nigh up at wrong time zones !!!

Rhiannon_Blaauw: Local time means that it is that time, no matter what time zone you are in. For example, if you are in NYC, 3-5 a.m. local time means 3-5 a.m. EST. If you are in Chicago, 3-5 a.m. local time means 3-5 a.m. CST.

Polarest: Is this where there will be pictures of the meteor shower?

Rhiannon_Blaauw: The feed below is showing a 21x15 degree field of view from one of the Meteoroid Environment Office's meteor cameras. We have already seen at least 8 meteors in it in the last hour.

Bava: When can I see the Meteor shower? I am going out and watching sky every now and then

Rhiannon_Blaauw: You can see the meteor shower any time after 10 p.m. local time - which is when the Perseid radiant rises. As long as you can see the constellation Perseus, you can see Perseids. However the best time to see them will be the early-morning hours before dawn (3-4 a.m. local time), as the radiant will be highest then.

Brooke_Moderator: Thanks for your patience as our experts take your questions!

Aragon_In_Houston: Thanks to NASA Marshall for hosting this chat...you are awesome, guys and gals!

Rhiannon_Blaauw: You are so welcome! We are happy to do this! And happy that you guys are interested in this nice meteor shower.

Bill_Cooke: Look up at the sky and away from the moon.

SNOWBOYJR: Which direction is the best to look at?

Bill_Cooke: Yes, Huntsville, Alabama.

nr552: Where is the feed coming from, Alabama?

Bill_Cooke: You should start seeing Perseids after 10 p.m. local time.

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Rhiannon_Blaauw: Since the moon is so bright tonight, it would be best to look up to the sky to take in as much as possible, which would normally be straight up, but in tonight's case make sure you are not looking directly into the moon.

Squirrel: From Tampa Bay area, what direction shld I be looking? NE, N? Trying to avoid moon overhead/

xEcho_Ryx: When will the meteor shower appear?

Bill_Cooke: Yes, the Perseids last from late July to second week in August, whereas showers like the Draconids only last a few hours.

Geminid: Are some meteor showers longer in duration than others? It would seem natural that space debris would be variable in field size.

Bill_Cooke: You should be able to see bright Perseids if you can see stars.

Lndian: im in nyc (the bronx). of course there is light pollution but i can see some stars from my back yard. wondering if this is a a good indicator of me being able to see the show from my own yard or is there too mcuh light?

May: Where do these meteors comes from? And how long have they been traveling?

Rhiannon_Blaauw: The Perseids come from comet Swift-Tuttle. As Swift-Tuttle orbits around the solar system, it deposits particles. When the Earth passes through that stream of particles, we see the Perseids. Some of these could have been travelling around the solar system for over 1,000 years already.

Bill_Cooke: Because that is when Perseus (the direction from which the meteors appear to come) is highest in the sky.

CapeCodGazers: Hi! Why is 3-4am the peak time to see the meteor shower no matter what time zone you're in?

Bill_Cooke: If you can see the stars in the Big Dipper, you should be able to see some Perseids.

Pancake: What's the best advice you can give to someone who lives in a city/suburb to give the best visuals of the Perseids, and can only do so much to reduce local light pollution without going out of the city?

Jim: Why do the stars appear to flash in this view?

Rhiannon_Blaauw: It is a result of the video feed being transmitted. Also some twinkling can be due to atmospheric distortion.

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Bill_Cooke: Because the moonlight will wash out the fainter Perseids, leaving only the bright ones visible.

Willow : Why is it that the supermoon from last night will effect our vieweing of the Perseid meteors tonight?

Johny: Currently I am in Ohio, can I view the meteor if i were to stand out ther elong enough?

Rhiannon_Blaauw: If your skies are clear, you should be able to see Perseids. Give your eyes some time to adjust to the dark.

Duke: what is the best way to catch the shower w/ an amateur telescope - in S. CA

Rhiannon_Blaauw: The best way to see meteor showers are actually through your naked eye, not a telescope. You want to get as large a field of view as possible, and your eye does that quite well, whereas a telescope decreases your field of view.

Bill_Cooke: Perseids have damaged one satellite, Olympus, in 1993, but the International Space Station is armored against meteoroids and space debris, so there is no threat to it.

Fgodben: Hello. my name is Fernando and I'm from Chile. My question is: Do these meorites are a danger to satellites, including the International Space Station? Greetings.

Bill_Cooke: There are reports of meteors producing electrophonic sounds like you describe, but I have never heard any meteors make noise.

Pvjhawk: An amateur astronomer as a teen (and member, along with Bill Gates, of the AMS), I used to visit my grandparents in the middle of Montana every August. Big Sky country is great for watching Perseids! One year, I watched a bolide streak across the sky, and at the same time, I heard the decreasing pitch typical of when bombs drop from planes in the movies. I've read where meteors can sound like wagon wheels rattling, but never with sonic Doppler shift. Have any of you encountered this?

mack58: What exactly are all of these meteors made of? Do they totally burn up upon entering our atmosphere?

Rhiannon_Blaauw: These particles are a mixture of ice and dust. Perseids completely burn up in the atmosphere, and will not reach the earth.

Bill_Cooke: No, Perseids burn up about 50-60 miles above your head.

kd_sis: does the meteor shower touch the ground

Lonely: Please tell us which radio is that with live stream

Rhiannon_Blaauw: NASA's 3rd Rock Radio! :-)

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Johny: Are those white dots in the UStream video the meteor?

Rhiannon_Blaauw: Those white dots are stars. The meteors will appear as streaks.

Bill_Cooke: Perseids are rich in bright meteors, so you will see some nice ones, but the moon will drown out the fainter ones.

Starnerd: Will there be any nice big meteors tonight, or will they just be small. Does the moon stop you from being ablt to see any of the coments

Brooke_Moderator: Great questions! Be sure to watch the Ustream feed of the skies over Huntsville, Alabama: <http://www.ustream.tv/channel/nasa-msfc>

Brendan: ya'll picked some awesome music to play.

Bill_Cooke: Thank you. I'll pass that along.

Jaylina: It's raining in New York which means there's no possible way for me to see it outside right?

Bill_Cooke: If it's raining, you're not going to see meteors.

KryptoniteBrony: Will I be able to see through the clouds?

Bill_Cooke: No, you can't see meteors through clouds.

Aragon_In_Houston: Thanks for hosting this chat, fine folks at Marshall...greetings from Houston...no problem here, btw. Ignorant question...I heard that there is no upper lattitude limit to observe this event...why's that?

Rhiannon_Blaauw: Greetings, Aragon_In_Houston. You are so welcome! There is no upper latitude limit because all northern latitudes have good visibility of the Perseid radiant, which is in the constellation Perseus.

Danielle: Hi, I am in Maine. What is the best time to view the sky? 3 am?

Bill_Cooke: Yes, 3 a.m. is the best time to view.

Birdman26: a minute ago the was a brief flash that looked brighter than a meteor and moved slower, was that an iridian flare?

Rhiannon_Blaauw: That is possible. We do see iridium flares. It also could have been a satellite, as well see those.

TheMaxS: Is it right that this metor shower is caused by earth passing through the remnants of a comet?

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Bill_Cooke: Yes, the Earth is currently passing through debris left behind by Comet Swift-Tuttle.

Lnidian: im in nyc (the bronx). of course there is light pollution but i can see some stars from my back yard. wondering if this is a good indicator of me being able to see the show from my own yard or is there too much light?

Bill_Cooke: If you can see the stars in the Big Dipper, you should be able to see the brighter Perseids.

JJ: Will light pollution have a large effect on viewing the Perseids?

Bill_Cooke: If your sky is so bright you can't see the Big Dipper, then yes.

Duke: what direction is the Livestream, is it NE?

Rhiannon_Blaauw: The camera is pointed North, about 61 degrees above the horizon.

kelsieplus3: hi does anyone know if the shower is visible from california

Bill_Cooke: Yes, after 10 p.m. Pacific.

SumitsYourMan: any particular direction I should be looking at? I am in mid atlantic region

Bill_Cooke: Look up, away from the Moon. Other than that, no preferred direction.

Amy: How big are the "particles" that form the meteors?

Rhiannon_Blaauw: The ones you will see in this live-feed are millimeter-sized particles, the ones you see with your naked eye are closer to centimeter-sized particles.

kd_sis: could there be a shooting star in a meteor shower

Bill_Cooke: Meteors are shooting stars, so yes, meteor showers are full of shooting stars.

Starnerd: How fast are the meteors traveling up in the sky?

Rhiannon_Blaauw: The Perseids are travelling at 130,000 miles per hour! 😊

SirPent: Any suggestions for photographing the Perseids??

Rhiannon_Blaauw: Meteors can be photographed if you have a long-exposure camera - set a 5-10 minute exposure and open the iris all the way.

Laydon56: are all the meteors tonight from the Perseids?

Bill_Cooke: No, there will be a few Kappa Cygnids and some background meteors, as well as Perseids.

Alex: Im from santa rosa california, whats the best time to watch?

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Bill_Cooke: 3 a.m. to dawn local time.

Briggs: Hi. I'm in New Jersey and the weather forecast is rain through tomorrow afternoon. Can't see it with the naked eye obviously but will I be able to see it on the Ustream?

Rhiannon_Blaauw: Yes, you should be able to see meteors on the Ustream. It is still early-evening, but you will see more as the night goes on. We have already seen over 10 in the last 1 1/2 hours.

Willow: Where did the Swift-Tuttle come from?

Bill_Cooke: Swift-Tuttle is a comet and probably came from the Oort Cloud.

iclp14: What time will be best to see the live stream currently showing?

Rhiannon_Blaauw: 3-4 a.m. CST is the best time to watch the live-stream, because it is located in Huntsville, AL.

Brendan: are we going to see, "comet swift-tuttle"?

Bill_Cooke: No, it is too far away from Earth to see. It will not be close to Earth until the year 2126.

KryptoniteBrony: Are the meteors actually coming into the Earth's atmosphere, or are they flying around it?

Bill_Cooke: Yes. The meteors hit Earth's atmosphere and burn up, which leaves the streak of light you see. They do not produce any light outside the atmosphere, so you would not be able to see them.

SAOKryptoniteBrony: Will I still be able to see them through the clouds?

Rhiannon_Blaauw: It is unlikely. Clouds hamper any meteor-viewing.

Brooke_Moderator: We have a flood of excellent questions! Thanks for your patience as our experts are responding....

mack58: Serious Question. How is the ISS armored against meteoroids? Is it that they just adjust position or is there actual hardened walls?

Rhiannon_Blaauw: The ISS is armored with 'stuffed bumper shields' that can protect against meteoroids up to 1" (2.5 cm) in diameter.

JJ: What kind of camera is being used in the livestream?

Rhiannon_Blaauw: The camera is a Watec 902H2 Ultimate CCD video camera with a 17 mm focal length Schneider lens (f/0.95) on it, producing a 21x15 degrees field of view.

fractal: How long do the streaks of light last? If I blink will I miss it?

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Rhiannon_Blaauw: It depends on how bright they are. The dimmest ones will only be fractions of a second, but the brighter ones can be a second long.

Mansquito: I always wondered how you predict when the showers are going to take place? Also when was this method first used. Who was the first to predict meteor showers?

Bill_Cooke: We are able to use computers to simulate debris coming off a comet and predict when that debris will hit the Earth. This method was developed in the late 1990s. There were crude predictions of meteor showers before this and the first person to make a meteor shower prediction was Denis Olmstead who predicted that the Leonids would storm again in 1866.

Birdman26: sre the slow moving stars satilites?

Bill_Cooke: If they do not blink, yes.

Elvir: Im from ontario, what would be the best time to view the sky?

Bill_Cooke: 3 a.m. to dawn local time.

simpilot2001: Will clouds obstruct the view of Perseids?

Bill_Cooke: Absolutely. Can't see meteors through clouds.

Laydon56: alot of reports say to look NE, but if you lay on your back straight up you can see the whole sky? which is the best?

Bill_Cooke: Look up away from the Moon. Do not look northeast.

Grace: I know it wont happen tonight, but has a meteor ever gotten trapped in a black holes path and been eaten?

Bill_Cooke: Your guess is as good as mine. There are no black holes near us.

SAOKryptoniteBrony: So can we see the meteors before peak time?

Bill_Cooke: Yes, you will see Perseids any time after 10 p.m.

mack58: How big are these meteors before they re enter earths atmosphere?

Bill_Cooke: Perseids are anywhere from a millimeter to a centimeter in size.

Danf: Is there anything in particular that astronomers hope to learn from events like tonight or is it more of a side show for them at this point (meaning, just something nice to witness and view like the rest of us)?

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Rhiannon_Blaauw: The Perseids are a fairly consistent shower, but we still monitor the activity, to know whether unpredicted outbursts have occurred. The Perseids have outburst in the past (had rates higher than expected) and will likely outburst again in the future.

Bobboblaw: just saw something move slow. satellite or space station?

Bill_Cooke: Satellite.

mack58: Why is that such small particles can create such visible trails?

Bill_Cooke: Because they move very fast, 132,000 miles per hour and possess a lot of energy.

kelsieplus3: Kelsie from San Bernardino, California were outside in the front yard on blankets and have never seen meteor shower before are they supposed to look like shooting stars and if its after sunset can we see them now?

Rhiannon_Blaauw: You can start to see Perseids after 10 p.m. local time. Once you can see the constellation Perseus, you can see Perseids. The best time will be 3-4 a.m. local time. Hope you see some, Kelsie! ☺

simpilot2001: Will clouds obstruct the view of Perseids?

Bill_Cooke: Yes, you can't see meteors through clouds.

May: A moment ago there was a small dot going across the screen. It just looked like a white dot. Maybe a star but Earth doesn't travel that fast to be able to see a star moving that fast. I've seen similar things like that when we go out and just look at the sky. Is it a satellite of some kind or what other thing can it be?

Rhiannon_Blaauw: Likely a satellite.

DiamondLife522: where is the stream?

Bill_Cooke: <http://www.nasa.gov/watchtheskies/perseids-2014.html>

sillyblue6: can you use a iphone 5s camera?

Rhiannon_Blaauw: You really need a camera that is able to take long-exposure pictures, and I don't think the iphone 5s can do that.

Eow: when we say these are dust particles but these must be sizeable objects to burn up and create bright streak in the sky ! I doubt any satellite or space stn can withstand the direct impact ?

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Rhiannon_Blaauw: These particles are actually only millimeter or centimeter-sized, however the ionization spreads out much larger than that, so that is why we can easily see the light from a centimeter sized particle.

Paulo: why is viewing time always 3-4 am

Rhiannon_Blaauw: 3-4 a.m. is when the Perseid radiant (which is in Perseus) will be highest in your sky.

123456: At what rate of speed are they traveling?

Rhiannon_Blaauw: 130,000 miles per hour!!

Nick: where is the best spot to see a meteor in South Carolina at Hilton Head?

Bill_Cooke: Anywhere dark.

TheMaxS: How dark will it need to get to see the meteors? I'm in an apartment complex, and there are a decent amount of lights on...also it's only 8:20 currently, so I definately won't be able to see them until a lot later...

Bill_Cooke: You need to be able to see the stars in the Big Dipper.

JAW: How do comets get their name, e.g. comet swift-tuttle?

Bill_Cooke: Comets are named after their discoverers.

Brooke_Moderator: Thanks for all the great questions as our experts work on answers. We're seeing some good meteor activity on the Ustream feed. Our astronomy team says that if you see something moving across the Ustream view and not blinking, it's most likely a satellite. Perseids move at about 132,000 mph, so they streak across the screen very fast.

Bjdean: How much comet debris is left? Can you predict when we won't see this anymore?

Rhiannon_Blaauw: Comet Swift-Tuttle is still active and depositing dust around the Solar System. Thus the stream is getting replenished still and we have no indication that the Perseid stream will go away any time soon.

GG: What causes meteors to burn up?

Bill_Cooke: They hit the atmosphere at tens or hundreds of thousands of miles per hour. At these speeds, contact with the air produces heat, which causes them to ablate or burn up.

n2pp: As a matter of information, amateur radio operators will be bouncing VHF radio signals off the ionization cloud caused by the Perseids and actually communicatng with other amateur radio stations

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over a distance of greater than 1500 miles. This is just one exciting aspect of amateur radio. Go to ARRL.com for info on amateur radio.

Rhiannon_Blaauw: Yes. Very interesting! This is a hobby of one of our coworkers.

Hirt: For Ohioans, would now (11pm) be a good time to go outside and see?

Bill_Cooke: You would be able to see a few Perseids. Best time is from 3 a.m. to dawn.

mack58: True or False. UFOs are controlling these meteors as we would control remote control airplanes. AND GO!?

Bill_Cooke: False.

Zeebe: Will there be a video recording of the shower? My son wants to see it, but there is no way I will wake him up at 2am

Rhiannon_Blaauw: We will reply the Ustream feed during the day tomorrow.

Miki: Ive been waching the Ustream for about 5-10 minutes now. I've seen 2 'dots' move from left to right in a downward angle, one 'dot' move up and one move down. What was I seeing?

Bill_Cooke: Probably satellites.

Ewellington: I'm now in Trinidad & Tobago, what time is better to see the shower ?

Bill_Cooke: Between 3 a.m. and dawn.

S: Is there a slight chance of seeing it though (follow up ques.)?

Bill_Cooke: Not if you have clouds.

Tony!: Is there any chance of catching any before 11 PM?

Bill_Cooke: You will see a few meteors before 11, but not many.

DiamondLife522: All i see is red sky in Massachusetts whatb time will it start

Bill_Cooke: After 10 p.m. local time assuming your skies are clear.

Jim: What is the average diameter of the Perseid meteors?

Rhiannon_Blaauw: The average diameter of Perseid meteors that you will see in the Ustream feed is 1 millimeter. The average diameter of meteors that you see with your naked-eye is 1 centimeter.

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Aragon_In_Houston: I wish I had paid more attention in college. Anyway, if Earth is meeting the debris from Swift-Tuttle, is it accurate to say that they are travelling at 130K miles/hour? I guess the question is...speed relative to what? Also, how common is to meet debris from comets from the Oort Cloud? If I remember correctly, the Oort Cloud is pretty far away...thanks in advance for your answer.

Bill_Cooke: They are travelling 132,000 miles per hour relative to Earth. The Oort Cloud is far away, almost a light year. Swift-Tuttle started out there, but is now in an orbit that takes it out past Uranus.

Jim: Can you provide us with any interesting facts about the Perseids that I may be too naive to ask about?

Rhiannon_Blaauw: The Perseids have been seen for about 2,000 years! They are recorded in Chinese annals up 36 AD, and consistently in the 8th, 9th, 10th, 11th centuries. Pretty cool to think of watching the same meteor shower as our ancestors!

Twistedad: what brand of video camera should i be using to capture this specific meteor shower

Bill_Cooke: We use a Watec low-light level camera to capture meteors.

Atticus: When will the next Perseid shower be?

Rhiannon_Blaauw: Next August! The Perseid meteor shower occurs when Earth passes through the stream of debris that was left by comet Swift-Tuttle, and that occurs at the same point in its orbit (i.e same time each year).

mack58: It's interesting that such small dust and ice particles can create this kind of show. How large does a meteor have to be to survive re-entry and hit the ground on earth?

Bill_Cooke: It's more a question of speed and composition. Slow-moving rocky meteors from the asteroid belt are the ones that produce meteorites on the ground.

Thisisaname: this may be a ludicrous question, but who chooses the music for the livestream?

Danielle_Moser: The music is Third Rock Radio, and presumably the radio hosts choose what songs play.

JAW: Serious Question. Will these questions and answers be available to download?

Bill_Cooke: There will be a transcript posted within a few days.

Marenco: Do you have an estimate of how many meteors would we be able to see tonight?

Bill_Cooke: No. Depends on your skies and latitude.

bigtd1986: what are the odds of any of them making it to the ground?

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Rhiannon_Blaauw: The odds of Perseids making it to the ground is nothing. Perseids completely burn up by 50 miles above the Earth. Other meteors in the past have made it down to the ground as meteorites, but those are generally more dense material from asteroids, not cometary material.

Manoutofthepast: The meteors are moving at around 60,000 meters per second right? or is that how fast the Earth impacts them on its orbit?

Bill_Cooke: Yes, the meteors are moving 60,000 meters per second relative to Earth.

BiannaL: In Florida, do you think we will see something before midnight?

Bill_Cooke: You will see a few meteors before midnight.

Eli: why do some sites say to look NE

Danielle_Moser: Those sites are probably recommending that you look at the Perseid radiant (where the meteors appear to come from), which is in the NE. But you don't really want to look toward the radiant. You want to shade yourself from moonlight and look up.

R: In Las Vegas, Nevada when is the best viewing time?

Bill_Cooke: 3 a.m. to dawn.

Megatron9: When is the shower supposed to end?

Bill_Cooke: The Perseids will go on for a few more days.

Cosmonautical: Which direction should I look for the best view?

Rhiannon_Blaauw: Look up, but also make sure you are not looking directly at the bright moon. Let your eyes adjust to the dark, and enjoy! Hope you see some. 😊

Briggs: Looking for the meteors, I noticed the stars "twinkle" effect. How does that occur again?

Bill_Cooke: The twinkling of stars is caused by the motion of air in our atmosphere refracting the light.

Penny: Is it possible for some of the meteoroids to fall and reach the earth's surface before they burn up?

Danielle_Moser: Some meteoroids burn up completely in the atmosphere. Some meteoroids survive re-entry and make it to the ground, as meteorites. Perseids don't produce meteorites -- they are going too fast and burn up completely in the skies overhead.

Bshaw: any answer for the next comet that can be seen with the naked eye in USA

Bill_Cooke: No, no naked eye comets any time soon.

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Amy: Thanks for your patience with everyone's questions :) Y'all are great! You said the meteors are travelling 130,000 mph... Is the debris outside the atmosphere also moving really fast, or is that speed caused by Earth's gravity pulling it in?

Rhiannon_Blaauw: Great question! The Earth's gravity does draw them in, but they are also moving with enormous speed themselves.

Clousecm: What direction of the sky is the live stream pointing towards and why does it appear there is no moonlight?

Danielle_Moser: The stream is pointed North, above Polaris, and away from the moon.

Rick: You mentioned that the Livestream is pointed North at 61 degrees elevation. For orientation, is that Polaris is the lower center part of the screen?

Bill_Cooke: No, the constellation visible in the LiveStream is Draco.

Pvjhawk: What about the burst-phenomenon like back around 1967, with 100,000 Perseids per hour?

Rhiannon_Blaauw: 100,000 perseids/hour is a fable. The highest rate was 300 per hour, seen back in 1993.

Karen_in_Atlanta_Georgia: We can't see anything with the naked eye here. Glad to be able to view on your website! I haven't seen any "tails", just the movement of the lights.

Rhiannon_Blaauw: Glad you have joined us! ☺

Amy: Thanks for answering all these questions!!! Do you think I might get a chance to see any meteors when I go camping Saturday night, or will it be over by then?

Bill_Cooke: Even if there is no meteor shower going on, you should be able to see five to eight meteors per hour under dark skies.

Username: i really want to see the meteors so is there anything i can do to see them even though it is really cloudy outside

Rhiannon_Blaauw: Just watching the live-feed, or driving to an area without clouds. Sorry that the weather isn't great around you!

TheMaxS: How should we take long-exposure pictures? Point it at the sky and wait for an hour?

Bill_Cooke: Five or ten minute exposures pointed at a dark patch of sky.

Lmankowski: How many meteors, on average, pass by us over a period of a year?

Bill_Cooke: No way of knowing.

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julyjade24: How do we know if we're seeing a satellite or meteor?

Bill_Cooke: Satellites are very slow-moving; meteors will be fast streaks.

Kduke: Will there be the same amount of meteors in the shower tonight as opposed to tomorrow, or will they be about the same each night?

Rhiannon_Blaauw: The rates will greatly decrease tomorrow. You can see a live-ZHR-graph on imo.net which shows currently how many Perseids are being seen around the world. This also shows how much the rates increase on the peak night (which is substantial, for the Perseids). Some meteor showers have very 'shallow' peaks, meaning that they peak over several days or even weeks, but the Perseids are much stronger on the peak night. This doesn't mean you won't see them tomorrow night, but the rates will be much lower.

Eli: if the radiant is in Perseus, how could the meteors be anywhere in the sky?

Bill_Cooke: The meteors appear to come from Perseus, but they can show up anywhere in the sky. If you trace them back, they will originate in the constellation of Perseus.

Ra: How is it that it will be seen 3-4 AM in any time zone you are?

Danielle_Moser: The time, 3-4 a.m. local time, is based on when the radiant is high in the sky and the sky is dark. That happens at approximately the same local time across time zones. The main stream of Perseids is millions of miles long, and takes the Earth days to cross it. So the entire planet (well, the Northern Hemisphere anyway) can experience night while the shower is still going on.

Greg: Bill, can you tell me what direction the MSFC camera is pointing? The field looks vaguely like Cygnus or Sagittarius.

Bill_Cooke: It is pointed at the constellation of Draco. It is centered on azimuth 342 degrees, altitude 61 degrees.

Prynok: So is it 3-4 for all time zones?

Bill_Cooke: Yes.

Grace: why don't the meteors take orbit around earth? if space is warped because of earth's presence why are the meteors and the moon affected differently by gravity (other than how strong gravity should be)?

Rhiannon_Blaauw: The Earth's gravity draws them in. Also it is possible that meteors could be caught into orbit around Earth, but that would be rare.

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TBrown: What direction should we be looking?

Danielle_Moser: You don't need to look in a particular direction. Get away from nearby light sources and look up. If possible, you'll want to shade yourself from moonlight - sit in the shade of a house, tree, mountain, etc, but leave an otherwise open view of the sky.

Xochitl: I live in Santa Ana, CA which is around LA, will I be able to see the meteor shower?

Bill_Cooke: You will start seeing Perseids after 10 p.m. if your sky is clear and dark.

Ralf: Do you know how many meteors have been seen in your camera so far tonight?

Bill_Cooke: We will count them tomorrow.

Darrell: when will the next visible comet pass by earth will it be soon or a long wait

Bill_Cooke: Have no idea.

Danf: is tonight the last night to view the meteor shower or will we see remnants for the next few nights as well?

Bill_Cooke: You will be able to see some Perseids over the next few nights.

TBone: Are there visible meteors out of the view of the livestream?

Danielle_Moser: You can see meteors in the live stream. You can also see meteors in your own skies if its night time and clear and you go outside for a spell.

bigtd1986: When is the next meteor shower and what is it called?

Bill_Cooke: The next good meteor shower will be the Orionids in October.

Atticus: Do you work for nasa as your day job? If so, what do you do and how did you get the job?

Rhiannon_Blaauw: We all work at NASA's Meteoroid Environment Office (MEO). It is our full-time day-job. The MEO's purpose is to study meteors, specifically to understand and predict risk to spacecraft. I, personally, got my job as I did my Masters thesis on meteors (using a meteor radar), thus gaining experience in the field. It is a great job and I love working here!

simpilot2001: Would it be worth it to get up at 3:00 and watch Perseids?

Bill_Cooke: Sounds like a plan.

mendezcan: just a little bit of drizzling affect the vision of seeing the meteors ?

Bill_Cooke: If it is raining and you have clouds, you are not going to see meteors.

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Megatron9: What are meteors composed of?

Bill_Cooke: Perseids are bits of ice mixed with dust.

catty124: When is the best time to watch the meteors? Tonight or tomorrow?

Danielle_Moser: Tonight is the traditional peak. But you should still be able to see some tomorrow night too.

Xsnake: what is best time in California?

Danielle_Moser: Between 3 and 4 am local time, when the radiant is high in the sky.

Bshaw: will the moderator and other nasa members be chatting live until dawn?

Rhiannon_Blaauw: We will be chatting until 2 a.m. CST, so just over another 3 hours. ☺

Prynok: Is 3:30 A.M a good time to watch?

Danielle_Moser: That will work!

Cubby: What's the orientation of the Ustream camera? Location?

Rhiannon_Blaauw: The Ustream is from a camera located at Marshall Space Flight Center in Huntsville, AL. The camera is a Watec 902H2 Ultimate CCD video camera with a 17 mm focal length Schneider lens (f/0.95) on it, producing a 21x15 degrees field of view. It is pointed at 61 degrees elevation, 342 degrees azimuth.

Brooke_Moderator: Hello everyone -- Bill Cooke will be right back. He's making a quick sky check! Rhiannon is working on your queue of questions.

Raj: Is the earth moving past the dust particles causing the streaks?

Danielle_Moser: Both the Earth and the dust particles (meteoroids) are moving. When the meteoroids enter the atmosphere they ablate/ionize and create the streaks of light called meteors.

Susie: I live just outside of Boston and I'm having trouble seeing any stars at all. Does this mean I'm probably not going to be able to see any of the meteors?

Danielle_Moser: Unfortunately, it'll really lessen your chances of seeing Perseids if you can't see stars.

Zeebe: Is the Swift-Tuttle comet ever visible and when will it be visible again?

Danielle_Moser: Swift-Tuttle will be visible again in 2126! It was last near the Sun in 1992.

Apetty: What Time should I be seeing them In Arkansas USA?

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Danielle_Moser: Between 3 and 4 a.m. local time!

Sandilyaparimi: cannot see the perseid shower from seattle wa

Danielle_Moser: You should be able to if you have clear weather.

Jon1967: Here in the Chicago area the moon is so bright even in the areas outside the city. Will we be able to see the meteor shower?

Rhiannon_Blaauw: The moon does hamper meteor-viewing, significantly, unfortunately. You should still be able to see the brightest Perseids, though. If there was no moon, you could see up to 100 per hour, but tonight you may see up to 30-40 per hour in the early morning hours (3-4 a.m. local time).

Bottleworks: Does the ISS have to prepare for this meteor shower? How does it look from the vantage of the ISS?

Bill_Cooke: No, it is armored. Astronauts look down to see meteors, not up, because the atmosphere is below them.

mack58: You mods are great. Thank you. I'm just having fun, and you guys have a sense of humor which is awesome.

Rhiannon_Blaauw: Thanks ☺ I think you need a bit of a sense of humor when you are staying up all night, so that you don't go crazy!

Bubblegum_Post: Sorry we're late. Had to install JAVA. Should be pretty good viewing in Oregon.

Danielle_Moser: Had that same problem myself! Welcome!

vir821: Laredo, Texas when is the best viewing time?

Danielle_Moser: Between 3 and 4 a.m. your local time.

waitingfortheperseids998: From what I learned in science class... the earth is never in the same place more than once. If this is true, then how do we see the Perseids every year if both Earth and the swift-tuttle have different orbits?

Bill_Cooke: The Earth travels in an orbit and it repeats this year after year. Swift-Tuttle is also in an orbit around the Sun and we get the Perseid meteor showers near the place where the orbits intersect.

Jon1967: Here in the Chicago area the moon is so bright even in the areas outside the city. Will we be able to see the meteor shower?

Bill_Cooke: If you can see the stars in the Big Dipper, you should be able to see Perseids.

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Brooke_Moderator: Welcome to another astronomy expert, *Danielle_Moser!* We're glad to have her here tonight to help with your questions...and there are a LOT of great questions in our queue. Thanks for your patience.

Eusteroid: What is the next major meteor shower predicted?

Bill_Cooke: Orionids in October.

Choppr: Where is the camera located?

Bill_Cooke: Huntsville, Alabama.

Monique: kind of overcast where i am just north of boston - not sure i'll see anything! :(

Danielle_Moser: Sorry to hear that!

Indagate: Have we ever noticed a shift in the perceived meteor shower debris fields in the sky; hence, indicating a possible shift of the source object's trajectory?

Bill_Cooke: No.

AIDS: So 3-4 am in Chicago?

Bill_Cooke: Yes.

King_Slavs: Are the Perseids generally made up of the same minerals?

Rhiannon_Blaauw: Perseids are all made of what comet Swift-Tuttle is made of - dust and ice. ☺

Cristina: when is the best time to see the meteor showe in Houston TX?

Danielle_Moser: 3-4 a.m. your time

SirPent: Why is it that 3am-4am is the best time to see Persieds? That doesn't seem to be 'Time Zone Specific'....

Bill_Cooke: Because that is when the radiant is highest in the sky from your location.

Mansquito: At 11:34 EDT I witnessed a iridium flare while I was outside here in Louisville, KY. I witnessed the white flash then about 10 seconds later it flashed red. Were my eyes playing tricks on me or is a red flash typical?

Bill_Cooke: Red flashes have been reported.

Riley: im in dville indiana any help with where and when i should look

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Danielle_Moser: Look tonight between 3 and 4 a.m. No need to look any particular direction -- just up. ☺ Oh, and you may want to shade yourself from the bright moon if possible. Keep it out of your field of view.

Birdman26: about how much money would a in tact meteoroid go for?

Bill_Cooke: Don't know; check eBay.

BigDaddy: since the moon is so large, will it affect the flow of the metors?

Bill_Cooke: No, the Moon has very little gravitational influence on meteors.

BostonGazer: At approximately 11:34 pm Eastern two close bright dots moved down the middle of the screen, was that a satellite?

Bill_Cooke: Probably an airplane.

Fallingrocks: what are the numbers at the bottom of the live stream?

Danielle_Moser: It relates to the number of viewers

Scary: How about Indiana?

Bill_Cooke: What about Indiana?

Fabianb: any1 knw the exact time where there are suppost to be meteores showing im in north America

Bill_Cooke: Best viewing will be between 3 and 4 a.m. in North America.

Wendy: Is yours a job that regularly requires having to stay up late at night, or are you usually daywalkers?

Rhiannon_Blaauw: I stay up late (or wake-up really early!) for big meteor showers, any meteor shower outbursts (like the May Camelopardalids this year), or to run the telescopes.

http://www.nasa.gov/offices/meo/environments/lunar_detail.html We use telescopes to detect meteoroids hitting the moon. These nights only ends up being a couple times a month, so not too bad. Mostly a day-walker. ☺

Thomson: why is there a "point" where all the meteors seem to be flying out? Is it everyplace the same?

Bill_Cooke: Because the Perseids are moving parallel to each other and just like the rails on a train track, parallel trajectories will appear to converge in the distance.

Wonder_woman: What is Perseus?

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Danielle_Moser: Perseus is a constellation in the north/northeastern part of the sky, near the constellations of Cassiopeia and Taurus. It was named after a Greek mythological hero who slew Medusa and rescued Andromeda from Cetus the sea monster.

Mromani: any chance of colision with Swift-Tuttle?

Bill_Cooke: Not for the next several hundred years.

Eow: Is your camera moved from original angle/position ? can you check ?

Bill_Cooke: The camera does not move during the night.

Riley: chris can we see anything before 12am eastern in indiana

Danielle_Moser: You can see Perseids, but because the radiant is lower you won't see as many as you would if you were looking in the early morning hours.

Fallingrocks: how do you know they are ice and dust, have you caught one?

Bill_Cooke: Because comets are made of ice and dust and Perseids come from a comet.

VonRicter: If there are some clouds in the distance will i still be able to see the meteors?

Bill_Cooke: If you have clear skies, elsewhere you may be able to see meteors in the clear patches.

Adolfito: how fast can a perseid travel before hitting the atmosphere?

Danielle_Moser: Perseids travel at 132,000 miles per hour (59 kilometers per second). This is about 100 times faster than the Concorde jet.

simpilot2001: What would be good times to see meteors tomorrow night?

Bill_Cooke: Same times as tonight.

Grace: why dont the meteors take orbit around earth like the moon? if space is warped why does gravity affect the moon and meteors differently? other than how strong the force should be?

Bill_Cooke: Because they are in orbit around the Sun.

Crystal16: The last time that this meteor was visible was in 1881 is that correct?

Rhiannon_Blaauw: I believe you mean comet. Comet Swift-Tuttle was last observed in 1992. It has a period of 133 years so it won't be observed again until 2126. The meteors from comet Swift-Tuttle are seen each August, when we see the Perseids!

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gcano611: My son is curious what kind of materials "dust & ice" are. For example, is gold burning up in these meteorites?

Bill_Cooke: There is no gold in a Perseid.

DogMeat: what's going on with the moon recently?

Danielle_Moser: The phase was full at the same time it reached the closest point to Earth in its orbit. They call it a "supermoon".

f1: What do you expect that we are going learn if we land in a comet this November?

Bill_Cooke: I'm sure we will be surprised. If I knew what we would learn, there would be no point in landing there.

Brooke_Moderator: Thanks for all the great questions, and also for reporting the meteor activity at your location...

Jonathan: How many meteor showers are there a year?

Bill_Cooke: Over four hundred are known; about ten are major showers.

jc9900jc: what is the best time in colombia

Bill_Cooke: 3-4 a.m.

Csick: What time do you think we will see them in Northeast TN?

Bill_Cooke: The Peak rates will be between 3 and 4 a.m.

Luis_Noguera: Why are the stars flickering?

Danielle_Moser: The stars are flickering, or twinkling, due to atmospheric turbulence.

Karen_in_Atlanta_Georgia: When I started watching Ustream, there were four "stars" to the right of the brightest star on the lower part of the screen. They were almost in a straight line. and now they are staggered more like two pairs. Why would that be?

Rhiannon_Blaauw: The stars are moving across the field-of-view all night, just very slowly. As of 10:40 CST (20 minutes ago), the field of view contained mostly stars from the constellation Draco. Here is an image showing which stars were in the field of view then,
<https://www.flickr.com/photos/nasamarshall/14903137315/>

Bshaw: will all meteor showers eventually die out?

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Bill_Cooke: No, because there are plenty of comets around.

Crystal16: the last time this meteor shower was visible was a 133 years ago is that correct?

Bill_Cooke: No, the Perseids occur every year. It was pretty good last year.

Zeebe: How dangerous is it for the astronauts on the International Spacestation with all of the debris that surrounds earth?

Bill_Cooke: International Space Station is armored so the danger is minimal.

EPRanch: After tonight, are there any good shows until November?

Rhiannon_Blaauw: The next good meteor shower will be the Leonids in November, and then after that the Geminids in December. I hope you get to see some Perseids tonight!

Indagate: Have we ever noticed a shift in the perceived meteor shower debris fields in the sky; hence, indicating a possible shift of the source object's trajectory?

Bill_Cooke: No.

Brooke_Moderator: Hey everyone -- we're getting a lot of questions about best time to view. You can see meteors any time after dark, but the projected peak time will be 3-4 a.m. your local time. This is true no matter where you are in the world. (Hola a todos - estamos recibiendo un montón de preguntas acerca de la mejor hora para ver. Usted puede ver los meteoros cualquier momento después del anochecer, pero el tiempo de pico proyectada será de 3-4 am hora local. Esto es cierto sin importar dónde se encuentre en el mundo.)

Kasacr: Do I have a better chance of seeing the meteors if I go outside or watching the live cam?

Bill_Cooke: If your skies are clear, go outside.

Hagar: whats the earliest to start seeing the shower at. Im near Cape Carnaviral.

Bill_Cooke: About 10 o'clock.

Bomb_Space: How much of NASA's budget was wasted on this radio station?

Bill_Cooke: None.

Riley: rhiannon will the camera ever be moved slightly to look at a different spot

Bill_Cooke: No. And this is Bill.

Aragon_In_Houston: Ok...this is something I don't understand. The meteors are debris from the comet Swift-Tuttle, which is a comet originated in the Oort Cloud. So, all local, meaning the Solar System and

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surrounding comet cloud. Then I read "if you trace them back, they will originate in the constellation of Perseus" ...not sure how many year lights that constellation is but I'm pretty sure it's not "local" ...so...it can't be both...I guess that mentioning Perseus is just because they appear to come from there but it's just confusing (at least to me).

Bill_Cooke: Yes, they only appear to come from Perseus.

simpilot2001: Will this chat be up tomorrow night?

Bill_Cooke: No. There will be a transcript posted in a few days.

slw326: Is it true that on any given night throughout the year it is possible to see 5-8 meteors per hour?

Bill_Cooke: Yes, with clear skies.

Adolfito: How fast can a perseid travel before entering earth's atmosphere?

Bill_Cooke: 132,000 miles per hour.

Gambait: What's the best time to see them in Maine?

Bill_Cooke: After 3 a.m. before dawn.

Karin: just making sure, how can we get the script of this live chatting? will it be posted on the site? thank you..

Bill_Cooke: Yes, there will be a PDF posted on the site.

Riley: hey bill will the camera ever be moved slightly to look at a different spot

Bill_Cooke: No, we don't move the cameras.

Thomson: How is the ISS protected against the meteors?

Bill_Cooke: It has a form of armor called a whipple shield. You can look this up on Google.

Amy: What's your favorite part of your job? and least favorite?

Rhiannon_Blaauw: The most favorite part of my job would be that I have such variety in my projects. Between Lunar Impact monitoring, meteor fluxes, working with radar data and all sky data, amongst many other projects, there is never a dull day and the work never gets monotonous. 😊

Flyingpandas: What correlation do the Perseids have with the Perseus constellation?

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Rhiannon_Blaauw: The Perseid meteors always radiate away from the radiant, meaning they're coming from the same direction. That radiant is located in Perseus, which is where the shower name is derived from!

Jd: How fast do the meteors travel on average? also thanks for doing this

Bill_Cooke: Approximately 54,000 miles per hour. Perseids move 132,000 miles per hour.

daisy1232: what time is the best view in florida

Bill_Cooke: 3 a.m. to dawn.

baddest1060769: can i use my dslr to take pictures or will it not look good

Rhiannon_Blaauw: Yes, set it to have long-exposures, 5-10 minutes, and open the iris all the way. You can get really pretty meteor pictures!

Danielaa: what time for New Jersey?

Bill_Cooke: 3 a.m. to dawn.

David: Is that time peak for all of Illinois?

Bill_Cooke: Yes.

breezybri13: Will they ever hit the ground or will the atmosphere burn them up?

Bill_Cooke: They burn up 50-60 miles above your head.

Flyingpandas: What part of the sky should we be watching?

Bill_Cooke: Look up away from the moon.

Adolfito: Can the perseids creat fires after heating on the atmosphere

Bill_Cooke: No.

Mangolyfe: so for the livestream, there will be the most visibilty at 3-4 am the time zone there?

Bill_Cooke: Yes.

Ryan: Any chance of seeing a UFO tonight? :O

Bill_Cooke: No.

Mromani: Swift-Tuttle passed near the Sun in 1992 and the best shower was in 93. Do the shower gets smaller every year?

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Bill_Cooke: It varies. There was a strong Perseid outburst in 2009 and they should be strong again in 2016.

mack58: There is a lot of talk about Iridium flares tonight. Can you maybe explain a little what they are?

Rhiannon_Blaauw: An iridium flare is when sunlight glints off a reflective surface of a satellite. It does not last very long, thus called a 'flare'.

Photon_A: What did the Earth say to the asteroid? Comet me. (Come at me) :

Bill_Cooke: Not bad.

ldow2000: What time zone is the camera in? In other words, how long until it's 3-4 am where the camera is?

Rhiannon_Blaauw: The camera is located in central time. So 3-4 a.m. is about 4-5 hours from now.

daisy1232: where is the video located ?

Bill_Cooke: The camera is in Huntsville, Alabama.

Ash21804: Is 3:30 AM The Best Time To Watch The Showers?

Bill_Cooke: Yes.

Fallingrocks: how do you know comets are ice and dust?

Bill_Cooke: Spectroscopic evidence, in situ measurements.

Ciro: Hi! there was 3 very bright stars on the left side...now there is only two..can you explain me that please?

Bill_Cooke: It is because the Earth is rotating and different stars go in and out of the camera at different times.

Flyingpandas: May I ask, what constellation is the telescope pointed at?

Bill_Cooke: Draco.

Photon_A: Could there be a possibility that the perseids could crash into the moon?

Rhiannon_Blaauw: Absolutely! One of the projects currently going on at the Meteoroid Environment Office is to study meteoroids hitting the Moon.

http://www.nasa.gov/offices/meo/environments/lunar_detail.html We have seen over 300 meteoroids hit the surface of the Moon, most of those are associated with specific meteor showers.

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Thomson: Great chat! But who are you guys?

Danielle_Moser: We are part of NASA's Meteoroid Environment Office. Check out meo.nasa.gov

BigDaddy: Do you have other cam's set up throught the USA, or just in TN

Bill_Cooke: Most meteor showers are comet debris. Some, like the Geminids, are pieces of asteroids, so yes, shower meteors have different compositions.

Suresh: Does the content of meteor showers differ from one another ? If yes what else it may contain ?

Rhiannon_Blaauw: We have cameras all over the USA. fireballs.ndc.nasa.gov is a public website which shows daily results from our all-sky cameras. We also have wide-field cameras which are both located in Alabama. The Ustream feed you are seeing is from one of those wide-field cameras.

CLIFF: will these be comming past the 12 and 13 of the month?

Bill_Cooke: Yes, you can see Perseids for a few more days.

Ross: where is the web stream coming from?

Bill_Cooke: Huntsville, Alabama.

dcb7: About how big are the meteors?

Bill_Cooke: Millimeter to a centimeter in size.

Riley: *Danielle_Moser:* which way will they be traveling

Danielle_Moser: The Perseids will appear to be coming from the constellation Perseus. (That's why they are named Perseids!)

neezybc559: immmm sooooo excited

Danielle_Moser: Then you're in the right place!

Richard: Is there a website that can tell you how well you can view based on your location (taking into account nearby city light)?

Bill_Cooke: Not as far as I know.

TheScoutRocker: What is the speed of the Swift-Tuttle?

Bill_Cooke: Depends on where it is in its orbit.

Tcoplin: What is the best time in Dallas, Texas

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Bill_Cooke: Between 3 a.m. and dawn.

Laydon56: any big fireballs on the stream yet?

Bill_Cooke: Haven't seen any.

DSO: Hey everyone, I'm new to stargazing. Are we seeing the meteors now or are they just stars?

Danielle_Moser: The live stream is showing a star field. Every now and again you will see a streak of light quickly travel across the screen -- that's a meteor!

Trikle: what is the best time in San Francisco to watch the perseid?

Bill_Cooke: 3 a.m. to dawn.

123415: hi .. whats the best time to view in Texas

Bill_Cooke: 3 a.m. to dawn.

Atticus: How far away from the city do you have to travel to get away from light pollution?

Bill_Cooke: You can see Perseids if you can see the stars in the Big Dipper.

lamhere: Can you manipulate the live feed so we atleast see few streks before going to bed ?

Bill_Cooke: Unfortunately, no.

Nick_Talsma: How big of a difference is the visibility rate at midnight vs the rate at 3-4 AM?

Bill_Cooke: About a factor of 2.

neezybc559: are shooting stars meteorites?

Danielle_Moser: Shooting stars, falling stars, and meteors are all synonymous. These are the streaks of light created when a space rock "burns up" in the atmosphere. If a meteoroid was to make it to the ground, it'd be called a meteorite.

Fabio: Please Will it be possible to see in Omaha?

Bill_Cooke: Yes, if the sky is clear.

Bshaw: JUST SAW ONE ON THE LIVE STREAM !

Bill_Cooke: Congrats!

Inspector_Gadget: Do all satelites have whipple sheilds?

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Bill_Cooke: No. The bigger ones have some shielding, but many do not have any.

Zeebe: Are there any videos on the web of the Lunar Impacts?

Bill_Cooke: Yes, Google "lunar impacts."

bdw1212: The camera is located in Huntsville, AL. is that a better viewing area?

Danielle_Moser: The camera is located in Huntsville because that's where we, the NASA Meteoroid Environment Office, are located. The location wasn't chosen just for this meteor shower. Huntsville is a pretty good viewing area right now because it's clear!

Fallingrocks: Bill seems to be a grouchy pants.

Bill_Cooke: Bill is always a grouchy pants. Think Sheldon Cooper.

Raj: So if the stars twinkle due to atmospheric turbulence, then why don't the planets twinkle?

Rhiannon_Blaauw: Stars are so far away that they appear as points, thus the light from the stars is very easy to distort. Planets are closer, and their light appears more as a disc (though a small disc), instead of a point. Thus Planets shine more steadily.

Toshiba: I can't find the live stream

Danielle_Moser: Scroll down below the chat room and you should find it. Or look for it here <http://www.ustream.tv/channel/nasa-msfc>

bigtd1986: You mentioned Lunar Impact monitoring: when is the last time that an impact on the moon has happened?

Bill_Cooke: Check the Marshall Lunar Impact Monitoring web site.

Teki: what time for iowa

Bill_Cooke: 3 a.m. to dawn.

y4ns: When we see something on livesteam?

Danielle_Moser: Meteor shower observing takes patience -- and coffee! ☺

Italog: what time is the best view in Colorado?

Bill_Cooke: 3 a.m. to dawn.

Shua: how large are the peices entering the atmosphere from this shower in diameter?

Bill_Cooke: A millimeter to a centimeter.

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Brooke_Moderator: Thanks for your patience as our experts answer your questions...and for everyone with Perseid visibility, you may see meteors after dark, but rates increase toward dawn. Projected peak is 3-4 a.m. YOUR local time, for everyone in the world with visibility. You can check this map to see your visibility: <http://www.nasa.gov/sites/default/files/files/perseids-viewing-2014.png>

mssimone04: i'm in GA and it states we should be able to see the shower at 11pm NE but I saw nothing...why?

Bill_Cooke: You need clear skies and you need to be outside for a while, like an hour at least.

breezybri13: How do you stay awake all night to watch these?

Bill_Cooke: I don't.

Whovianhiddlestoner: What's the best time to see the meteors in new york.

Danielle_Moser: Between 3 and 4 a.m. your time (eastern time)

JT: Is there any chace of this shower being a dud like the last 1? i think it leonids

Rhiannon_Blaauw: The Perseids will not be a 'dud', they have been seen for 2,000 years and are a very consistent shower. However because of the moon being so bright, you may see fewer Perseids this year. If you are referring to the May Camelopardalids as the shower that was a 'dud', well it wasn't entirely, because it was very rich in small particles, just wasn't spectacular to the naked eye. ☺

Tenn: I saw a really good one from West Tenn about 30 mins ago, just got back inside for the night. It really surprised me how fast and bright it was. By far the greatest "shooting star" I've ever seen.

Bill_Cooke: Congrats!

Johnnybegood: peak for SoCa?

Bill_Cooke: 3 a.m. to dawn.

Xsnake: Have anything happened yet

Danielle_Moser: We've seen some meteors in the live feed already, and some in our All Sky Network too!

Atticus: Can you start ignoring questions about peak time since all the info is available below the chat?

Bill_Cooke: I would love to, but people keep asking them.

Whovianhiddlestoner: What time best for New York

Bill_Cooke: 3 a.m. to dawn.

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Teki: about what time for iowa

Bill_Cooke: 3 a.m. to dawn.

Steve57: Is it true we see the meteors because the Earth passes through the trail debris of past paths?

Bill_Cooke: Yes.

Pkdunn: What is the elevation and azimuth of the cam?

Danielle_Moser: Az=342 deg, El=61 deg

y4ns: What kind of camera are you using?

Bill_Cooke: Watec 902H2 Ultimate.

Hagar: when the meteors burn up, does their dust fall to the earth or is the heat so extreme that there is nothing left?

Bill_Cooke: In the case of the Perseids, they completely ablate.

John: what is the average size of a Perseid meteor ?

Bill_Cooke: About a millimeter to a centimeter.

juan_matiz: how many meteors have been seen on the camera so far?

Bill_Cooke: We will have a count tomorrow. Haven't been counting tonight.

Brooke_Moderator: We got one! Video of a meteor seen a short time ago:
<https://www.flickr.com/photos/nasamarshall/14902953462/>

build5566: I live in Dallas Fort Worth, Texas when can I see the meteor shower

Bill_Cooke: 3 a.m. to dawn.

mssimone04: is the best time to see this in GA 4-5am?

Bill_Cooke: 3 a.m. to dawn.

Guido: will the lights of the city affect the visualization of the meteors?

Danielle_Moser: The city lights and the moonlight will both affect meteor viewing.

Bshaw: have any of the admins on here been on the science channel? wonders of the universe / how the universe works... etc....

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Bill_Cooke: No.

LoanWolf: so how close does tv have it when they how rocks smashing thure the ISS

Bill_Cooke: No rocks smashing ISS.

Johnnybegood: which is the size of the perseids? They can cause severe damage to the earth?

Bill_Cooke: No, they're way too small.

bigtd1986: just saw one at 12:15! woohoo

Rhiannon_Blaauw: Awesome! I know which one you mean. You must be on EST as it was at 11:14 CST. Was just posted on flickr here: <https://www.flickr.com/photos/nasamarshall/14902953462/>

Pvjhawk: Do any of you have any strong opinions on Tunguska?

Bill_Cooke: Nope.

Jaime: Hello, should I look directly to the Perseus constellation to get the best view? Thanks.

Bill_Cooke: No, you don't want to look at Perseus. Look elsewhere in the sky, away from the Moon.

Ash21804: It's Raining And Its Kind Of Cloudy Where I am. I am In New Jersey. Will I Likely Be Able To see The Showers?

Danielle_Moser: Unfortunately not -- not with rain and clouds.

Maumau: speaking of the moon, can you see the things left on the moon by the Apollo landings from here on earth?

Bill_Cooke: Nope, not with ground-based optical.

Ash21804: Are The Perseids' Tail's Or Just The Perseids Them Self Have Colors When They Go Through The Sky? Like Maybe Some Sort Of Blue?

Bill_Cooke: Some people see colors in Perseid meteors, but it varies from person to person.

Diamond_Dave: The farther the north the better? I am in Calgary.

Bill_Cooke: Yes, if you skies are clear.

Snoopypc: What is that chance a meteor will hit in south east TN

Danielle_Moser: The Perseid meteors will ablate (burn up) completely in the skies above your head, so no worries about one "hitting". You should have a chance to see some meteors though, if your skies are clear.

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neezybc559: wheres the live steam at i been lookinjg for it and i only got this chat boxes

Bill_Cooke: <http://www.nasa.gov/watchtheskies/perseids-2014.html> at the bottom.

LG_902: What time should Texas residents (Austin) be able to see the meteor shower?

Danielle_Moser: Between 3 and 4 a.m. your time (central)

alexander_kirschner: Just watched the Space Station fly over and saw a meteor pass by in front of it. I even got a picture of it! probably my best long exposure nighttime shot! so cool!

Bill_Cooke: Congrats!

gar352: I was just outside and saw 5 in about 15-20 min, most seem very short and did not last long

Bill_Cooke: Congrats!

iLoveSPACE: is there a difference between the perseids and other meteors?

Rhiannon_Blaauw: Yes. Perseids all come from comet Swift-Tuttle, thus their orbits and trajectories will be the same. Also they will all appear to radiate from the same point in the sky (though will appear all over the sky). Sporadic meteors (meteors not associated with a meteor shower) will appear to come from all different places in the sky.

y4ns: Bill what kind of operation system are you using in nasa office? UNIX?

Bill_Cooke: We use all sorts of operating systems: Windows, Mac OS X, Unix.

JT: is there a meteor shower related to haleys comet?

Danielle_Moser: Yes -- the Eta Aquariids in May and the Orionids in October

Zebo: If a meteor was only ice without dust would it still show signs of "burning up" in the atmosphere

Bill_Cooke: Yes.

Nancy: is the meteor shower on this page live..?

Danielle_Moser: If you click on it so that it's playing it's live from Huntsville, AL.

Alainaj: Hello! Aspiring astronomer/astrophysicist here entering her senior year of high school. Can anyone tell me a little bit about their educational background (or give me any advice?)?

Bill_Cooke: I have a Bachelors in physics and astronomy, a Ph.D. in astronomy. Need to like physics and math.

Gabby: Will meteorite be noticable if i am looking in the sky? Or can i miss it bc it won't be too bright?

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Bill_Cooke: You will see meteors if you have clear skies and are looking up.

Inspector_Gadget: Do you guys have your coffee with you? :)

Rhiannon_Blaauw: I downed a large coffee right before the chat started. We do have lots of snacks, though! Homemade chocolate chip cookies, candy, chips, among others! ☺

breezybri13: are they coming from a certain direction? For example north, south, etc.?

Bill_Cooke: Perseids appear to radiate from the Constellation Perseus, which is in the northeast.

Gabby: Which way do i look

Bill_Cooke: Look up, away from the Moon.

Ulysses : hy don't the people understand that everywhere it's best to see them from 3 a.m. to dawn?

Danielle_Moser: It may be because people are used to hearing about meteor outbursts in the news. With an outburst, you need to be in the right place at the right time to see the meteor shower.

zta192 If the meteors are only a centermeter in diameter, how are we able to see them from 60 miles down?

Rhiannon_Blaauw: The ionization from the meteor (which is what we see as light) spreads out to be millions of times the size of the particle. Thus if the meteor is only 1 mm or so in size, the streak of light can be at least the size of a battleship!

Elneto: It is raining here in NY and I am sleepy, would I have troubles watching the meteorites?

Bill_Cooke: If it is raining, you won't be able to see meteors.

Cc: do you have satelite cameras to view?

Bill_Cooke: No, we don't have access to cameras on satellites.

y4ns: how long you work for nasa

Bill_Cooke: Almost 20 years.

Ulysses: What time should Martians be able to best see the meteor shower?

Bill_Cooke: Why don't you go there and ask them.

Mromani: Do you have some image analyzer software for automatic detection? If yes, what?

Bill_Cooke: Yes, we do. It's called "Asgard."

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Gabby: im going to take a nap and be back so my eyes can adjust. sound like a good plan?

Bill_Cooke: It does.

Hagar: I was in huntsville when they showed the mock up version of the space shuttle back in 79 or so. My question is, what are the chances of this metoer storm blowing us into a firey death?

Bill_Cooke: Zero.

zta192: If the meteors are only a centimeter large how are we able to see them from 60 miles down?

Danielle_Moser: The meteoroids, or rocks, are small. But when they enter the atmosphere going 132,000 mph they create a long, bright streak of light we can see from the ground.

Holypope: Do we know what materials the Perseid meteors are made of? If so, do we know this from samples or is it an educated guess based on other factors such as the colors seen while they burn?

Bill_Cooke: We have spectra of Perseid meteors that give us evidence of some the elements in the meteoroid, so better than an educated guess.

Nancy: are you guys showing this live..?

Danielle_Moser: The meteor Ustream feed is live, yes.

Tammy: what direction are you looking in Huntsville?

Danielle_Moser: The camera is pointed north, above the star Polaris

mack58: What would happen to the ISS if a meteor were to miss a whippe shield and pass through its skin? Would it be a catastrophic failure or manageable?

Bill_Cooke: It would be manageable.

Holypope: If we took a rock made of the same materials on earth and heated it as rapidly as it does when it falls to Earth, would it radiate as brightly or does our upper atmosphere play a large role in the spectacle?

Rhiannon_Blaauw: The upper atmosphere does not have anything special about it, it is the friction with the atmosphere that causes the ionization.

Steve57: The rate for these meteors for this is 30 to 40 /hr. What is the highest rate of meteors you know of through out history?

Bill_Cooke: That would be the Leonid Meteor Storm of 1833, maybe a hundred and fifty thousand per hour.

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lamhere: is starting a chat bad idea for moderators ? miss the actual show ?

Rhiannon_Blaauw: I will go out after the chat is over (2am CST) and try to see some Perseids for myself.

Birdman26: what is the best way to make a timelapse video of a meteor shower?

Bill_Cooke: Sequence of exposures centered on Perseus probably. I'm not a photographer.

dfgdfg3455: Do you have to wait 45 minutes in a dark, secluded area before being able to detect the meteors?

Bill_Cooke: Not tonight; the bright moon is up.

@_jm66: is there a certain direction in which the meteores will soar. or do they go "all over the place"?

Bill_Cooke: All over the place.

Ulysses: Do you guys laugh at the silly "troll" questions people put in? Does it help with staying awake?

Danielle_Moser: I do laugh and appreciate the humor (yours included 😊). But we like real questions too!

H: Will I be able to see it? I live in Dallas

Bill_Cooke: 3 a.m. to dawn.

Netherlevity: so wheres the stream?

Danielle_Moser: The Ustream meteor feed is located below the chat window. Or you can go to <http://www.ustream.tv/channel/nasa-msfc>

Kartoffel: Where is this live stream located?

Bill_Cooke: Huntsville, Alabama.

Patrick_Henry: Hello, I am pursuing my bachelor's degree in network security and wondering does NASA have job opportunities within your space coalition of awesome?

Rhiannon_Blaauw: One of the best ways of getting an 'in' at NASA is to become an intern. There are internships in every area. <https://intern.nasa.gov>

Tenn: Rhiannon, what's your favorite cookie?

Rhiannon_Blaauw: Snickerdoodles are up there as one of my favorites! 😊

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Manoj: so far am completely disappointed. I have not found any meteor in dallas :(Infact how can we differentiate stars, satellite and Meteor ? Will meteor be fast moving ? Will meteor be same size of stars or will it look more brighter than starts and satellites ? Please help

Bill_Cooke: Meteors will be fast streaks. Satellites will appear to be slow-moving stars and will not blink.

Darrell: how long will the showers last just tonight or more then one night

Danielle_Moser: The peak is tonight, but we'll continue to see Perseid meteors for several more days (the rates won't be high though).

Shaun: I saw a couple just little bit ago.... got to see a really nice one!

Rhiannon_Blaauw: Fantastic! We love getting good reports!

neezybc559: is this meteor shower different from like an actual shooting star

Danielle_Moser: Meteors and shooting stars are words used to describe the same thing. But shooting stars aren't actually stars. ☺

H: Bill_Cooke, will I be able to see the shower? I live in Dallas, Texas

Danielle_Moser: Yes, if you've got some clear weather and you can see some stars.

SteveQ: WHY is visibility best after 3 a.m.?

Danielle_Moser: That's when the radiant (the place where the meteors appear to come from) is the highest in the sky while it's still dark.

dfgdfg3455: Would the meteors appear on the moon the same way they appear on the earth?

Danielle_Moser: The moon doesn't really have much of an atmosphere at all. So you wouldn't see meteors, space rocks burning up as they travel through the atmosphere, on the Moon like you would on Earth. We CAN see meteoroids impact the moon from Earth, though, and in fact have a whole observing program set up to do so. When the meteoroid hits the lunar surface some of its energy is turned into visible light which we can see with a telescope. Check out this page to learn more:

<http://www.nasa.gov/centers/marshall/news/lunar/index.html>

Thomson: Could you produce artificial meteors by shooting things down to earth from the ISS?

Rhiannon_Blaauw: No. You cannot get them to accelerate quickly enough. They would need to be at least 11 km/s. Good question, though. As a fun fact, astronauts on the ISS observe meteors by looking down, instead of up!

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Jenkey: i take it the blue spinning circles i keep seeing on the live stream are a tech/computer thing as no one replied lol xxx

Danielle_Moser: I don't see any circles -- perhaps the video is loading? Maybe a page refresh will help. You should be seeing white twinkling stars on a black background.

mack58: Bill one of the other mods said that rate was a fable...whos telling the truth?

Rhiannon_Blaauw: What I was referring to was the Perseids. The Perseids have never had more than 300/hours. The 1833 Leonids had a rate of 150,000 per hour. ☺ We are both telling the truth.

EmeraldBot: Do you guys usually stay up this late for work?

Bill_Cooke: Not usually.

s.spencer: I know the Perseid meteors pass every 133 years or so. Will they eventually all burn out? Or are more gathered during it's orbit around the sun?

Bill_Cooke: The comet generates new debris every time it passes around the Sun.

Patrick_Henry: Are there programs by NASA I can send my 7 year old to in Virginia?

Rhiannon_Blaauw: Space Camp, which is located in Huntsville, AL, is a great thing to send a 7 year old to!

Kartoffel: I live in the city; will the light pollution interrupt my view of the shower?

Bill_Cooke: If you can see stars in the Big Dipper, you should be able to see Perseids.

SteveQ: My dad said during boot camp in El Paso in I believe 1966, he saw a meteor shower that actually looked like a shower of light. Is he exaggerating or did that really happen?

Danielle_Moser: Wish I could have seen it. <http://www.space.com/13613-leonid-meteor-shower-peak-1966-storm.html>

Darrell: should meators be visable in kentucky havent seen one yet?

Danielle_Moser: Yes if you've got clear skies you should see a few. Between the hours of 3 and 4 a.m. are best though.

dfgdfg3455: What is the best music to listen to during a meteor shower?

Bill_Cooke: Tonight, I would be listening to "Bad Moon Rising" by Creedence Clearwater.

Bamacowboy: Bill_Cooke Are You In Huntsville ?

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Bill_Cooke: Yes, I'm in Huntsville.

queens_NY: can it be seen from Queens, NY? It's raining here though.

Bill_Cooke: Not if it's raining.

Greg: What's the different between a meteor and a meteorite? What's the threshold for the size of an object entering earth's atmosphere to either burn up or impact the ground?

Rhiannon_Blaauw: A meteoroid is the particle out in Space, a meteor is the phenomenon as it is burning up in the atmosphere, and a meteorite is the rock that makes it to the ground (if that happens, which is rare!). It depends on the material of the particle (i.e. asteroidal or cometary), the angle that it hits the Earth's atmosphere, its velocity, and other factors, but it generally takes an object at least a meter across to make it through the Earth's atmosphere to make it to the ground as a meteorite.

Pandora: Shame, it's raining here in Quebec and we're going to miss it. :(

Danielle_Moser: Rotten luck! Hopefully you will see some on the live feed! You are also welcome to check out meteors from the NASA All Sky Fireball Network. We post fireballs seen each morning.
fireballs.ndc.nasa.gov

Greg: Why does the meteor shower happen every year? Where do the meteors come from?

Bill_Cooke: The Perseids occur every year because the Earth runs into debris left over from Comet Swift-Tuttle.

Mister_Sin: im in ft worth tx southside of town... where should i go.. ???

Bill_Cooke: Somewhere where you can see the stars of the Big Dipper.

Pandora: Is there ever a chance that what flies across the night sky (meteor showers and whatnot) can actually hit earth?

Bill_Cooke: Slow-moving meteors from asteroids can produce meteorites on the ground.

Patrick_Henry: Do males have hair regulations while employed by NASA?

Bill_Cooke: I don't know; I don't have hair.

Cc: why not get a camera feed looking down from the ISS?

Rhiannon_Blaauw: They have done that, in the past! And actually there is a live-feed from the ISS that is constantly running <http://www.space.com/25797-nasa-hd-earth-from-space-video-webcasts.html> though currently (11:53 CST) the camera is on the daytime side of the Earth.

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Shaun: I'm in Central Arkansas, just north of Little Rock. I found an open area just up from my house, laid down on the ground and just watched the sky... few minutes later big streak moving NE>SW.... really pretty.

Bill_Cooke: Congratulations!

Atticus: Are impacts on the lunar surface visible through an amateur telescope?

Danielle_Moser: I know people who have successfully viewed lunar impact flashes with an 8 inch telescope. Here's a document on Minimum System Requirements needed to do your own lunar impact monitoring. <http://www.nasa.gov/sites/default/files/files/MinimumSystemRequirements6.pdf>

Manuel: hello people of the nasa

Danielle_Moser: Hello Manuel

Ksaw: do meteors ever hit satellites?

Rhiannon_Blaauw: Yes. Our main job at the Meteoroid Environment Office is to create and update models that predict the risk to spacecraft from meteors.

Lola: how can you find the big dipper in the sky

Danielle_Moser: Check out <http://www.most.org/StellariumGuide.pdf> or www.starrynighteducation.com/skychart for help visualizing the Big Dipper.

blyte1: Are there different classifications for comets? If so, what type is Swift-Tuttle?

Bill_Cooke: Yes. Swift-Tuttle is a short-period comet.

Tammy: I have seen two in Guntersville since about 11 Is there a public observatory in Huntsville?

Bill_Cooke: Yes. The Von Braun Observatory on Monte Sano.

Greg: What's the coolest thing about working for NASA?

Bill_Cooke: Doing these chats, of course!

Seeve: Huntsville Al coordinates

Bill_Cooke: You can google this.

Cricha: Isn't it true that one side of the moon seems to show more evidence of impact than the other side?

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Rhiannon_Blaauw: If you are referring to an image on <http://www.nasa.gov/centers/marshall/news/lunar/index.html#.U-rwNsZcQWI> there is an asymmetry in meteors seen hitting the moon, but that is mostly an observing bias, because we only look at the unlit portion of the moon. Additionally, the 'evening' side of the moon does tend to show more impacts per hour, however that may be because there is better visibility to meteor showers on that side.

Diamond_Dave: Loving the chat, some of the answers are very comical, some are greatly detailed.

Rhiannon_Blaauw: So glad you are enjoying it! :-)

Pandora: I think it is wonderful that you all are hanging out answering our questions! This isn't a question but an appreciation of all you do! xo

Rhiannon_Blaauw: Thanks for the feedback! We enjoy doing these!

Ksaw: is there video somewhere of the shower?

Danielle_Moser: Yes, the live Ustream feed of the night sky is below the chat. Or you can check out <http://www.ustream.tv/channel/nasa-msfc>

Alyssa: Do you guys study comets and asteroids too, or just meteors?

Danielle_Moser: We mainly study meteors/meteoroids, but since they come from asteroids and comets we study those too.

Aviva: What was the size of the smallest meteor found on Earth?

Rhiannon_Blaauw: Meteors (the streak of light in the sky) can be seen from particles as small as a grain of sand, or dust. This size of meteor can be seen with radars, such as the Canadian Meteor Orbit Radar, located near London, Ontario, which sees over 10,000 meteors a day.

Ethos: Is this an average sized (don't know what other word to use) meteor shower?

Danielle_Moser: The Perseid meteor shower is typically one of the best meteor showers of the year, along with the Geminids in December. But the moon this year is really putting a damper on observing a lot of Perseids.

Tammy: saw one on the live feed!

Danielle_Moser: Awesome!

Autovisual: What is the location of the sky in the livestream?

Rhiannon_Blaauw: 61 degrees elevation, 342 degrees azimuth, located in Huntsville, AL.

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Brooke_Moderator: Thanks for all of these terrific questions! Keep them coming, and let us know what you're seeing tonight as you watch the skies.

Inspector_Gadget: Do you guys have a favorite meteor/comet/asteroid?

Bill_Cooke: My favorite meteor shower is the Geminids and my favorite comet is Halley. My favorite asteroid is Apophis, named after the Egyptian god of chaos.

DianaGlzS: If I make a wish on one I see, would it become true? :) haha loving the chat, thank you for taking the time guys!

Bill_Cooke: I believe that would work if you were Jiminy Cricket.

Zlxvlzcx: Hello, will it be visible in manhattan, new york?

Bill_Cooke: Doubt it, if you're in downtown Manhattan, even if the skies are clear.

n5ark: Shaun, It is possible we just saw the same one...actually left a nice smoke trail that was illuminated by the moon...I am in SO Pulaski County on Old River....actually saw the reflection off the water first

Bill_Cooke: We just saw a double meteor in the livestream.

Patrick_Henry: Is it possible in the future for a live feed from to be broadcasted from a satellite during such event?

Bill_Cooke: Not in the near future.

Linda: Also my Grandson Javon is here with me and he wanted to know what does it take to become a Nasa Scientist?

Danielle_Moser: It'll take a lot of math and science classes in school and then college. It'd be good if he did some science internships or research projects while he's in college. NASA takes interns!

Greg: What are some elements commonly found in meteorites?

Bill_Cooke: Sodium, carbon, nickel, olivine, etc.

Subliminal: Cloudy for a second night in Port Perry, Ont. but I'm still watching to continue my 26 consecutive year viewing streak.

Danielle_Moser: Wow, that's quite a streak you have going! I'm impressed!

Hjkhk: a meteor can pass through the atmosphere, it is possible?

Bill_Cooke: Only if it's fairly large, slow-moving and comes from an asteroid.

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Johnnybegood: If the debris that interact with our atmosphere to create the Perseids originate from comet Swift-Tuttle, that means that sooner or later the comet will disintegrate? There are some estimates about how long it will take for this comet still bringing this extraordinary phenomenon?

Rhiannon_Blaauw: Yes, the comet will eventually disintegrate. That will take a long, long time, however, since the comet's period is 133 years (it only goes around the sun once every 133 years).

DianaGlzS: The slow moving red flashes in the sky are satellites?

Bill_Cooke: Red flashes are typically associated with iridium flares.

Batgyu: so where should I look for the meteors

Bill_Cooke: Look up away from the moon.

nanoo_nanoo: for you guys ?

Bill_Cooke: Shazbot!

Ksaw: are meteor pieces valuable?

Rhiannon_Blaauw: They can be. It depends on how many meteorites are picked up from a particular meteorite fall, how rare that type of meteorite is, as well as much other information! Ebay is a great place to look at meteorite prices.

Savannah_Lynn: Is Fort Worth supposed to be getting a large show yet? Seen a few shooting across, and I don't want to miss it!

Bill_Cooke: Peak will be around 3 a.m.

Batgyu: can it be seen from florida

Bill_Cooke: Yes.

Manoj: what is the current time of the live feed ?

Bill_Cooke: Approximately 12:12 a.m.

StarBot: Do you plan on the world ending any time soon?

Bill_Cooke: Not before I see the next Avengers movie.

Katiena: If the comet only goes around the sun every 133 years, how do we see this every year?

Bill_Cooke: Because we are encountering the debris left behind by the comet in past years, which spreads out along the orbit and we encounter this ring of material every year at this time.

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Spaceman42: Hello from Dallas, Texas, :)

Bill_Cooke: Hello, Dallas!

Batgyu: Where should I look in florida to see it

Bill_Cooke: Look up away from the moon.

Patrick_Henry: Do other planets have meteor showers also? As in Mars all the way through "pluto"?

Rhiannon_Blaauw: Yes. Great question. Other planets will have different meteor showers than Earth, as they will travel through debris left by other comets. For example, comet Siding Spring is causing a meteor shower on Mars in October (though the rates will not be nearly as high as originally predicted).

Sajani: the moon is rising fast from one side and the other side is filling up with some bad clouds... in san rafael. what will be the best time be to view it from here??

Bill_Cooke: 3 a.m. to dawn.

Danielle_Moser: Are you asking about meteor shower forecasting? I suppose you could say that. ☺ The model basically consists of taking a parent comet, and simulating the ejection of millions of test particles (aka meteoroids) from it. Then forces like gravity and solar radiation pressure, etc are used to evolve the particles around the solar system for hundreds of years. Then those particles that intersect Earth are used to create the forecast. All of this is done on several computers. Yay technology!

Pandora: How are the predictive models created? Does a lot of guess work and blood and tears go into it?

Bill_Cooke: We just saw two a couple of minutes ago.

ninas22186: why haven't I seen one on the live feed yet..... patiently waiting in Buffalo NY.... :(

igor_basalto: What time should be the best if you're in Colorado?

Bill_Cooke: 3 a.m. to dawn.

alexander_kirschner: Just saw an airplane pass in front of the camera. Kind of got excited for a sec. Darn, lol.

Danielle_Moser: Heh, sorry for the "fake out". It happens to all of us.

savvi515: which direction should i look from california?

Danielle_Moser: Just look up at the night sky, but away from the Moon.

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Thethirdwilliam: I'm a rising college sophomore. Are there any NASA internships / programs that let me focus on or work with meteor, comet or asteroid research?

Bill_Cooke: Go to <http://intern.nasa.gov>. NASA takes interns every semester and some opportunities are meteor and asteroid-related.

Mosster1: Seen a really great one over Aurora, CO. It appeared very bright, and looked as if it shattered, and left a bit of smoke

Bill_Cooke: Congrats!

JBB1029: Can I see the Meteor Shower in Fresno, CA?

Bill_Cooke: Yes, if your skies are clear.

Vijay: how do they look like on the feed

Danielle_Moser: They'll look like really quick streaks of light. You might blink and miss one, they are that quick!

Sajani: will i be able to see any meteors at this time in san rafael?

Bill_Cooke: A few if your skies are clear.

Dudeguy: Are you guys getting sick of being asked about what time the peak is at yet? What time is the peak at? ;)

Bill_Cooke: Getting mildly nauseous.

StarBot: What are your plans for the future?

Bill_Cooke: Go home and go to sleep.

rocknerd314: Could one of the meteors strike the moon or are they too far away?

Bill_Cooke: Perseids also strike the Moon as well as burn up in Earth's atmosphere.

emma3: is there any correlation between length of time since the comet passed through

Bill_Cooke: Not really.

Katiena: Are there meteor showers that appear in the US where we could see upwards of 100 or more an hour?

Bill_Cooke: The Geminids in December has rates of about 120 per hour.

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Twistedad: WHAT DIRECTION SHOULD I LOOK FROM CEDAR CREST BLVD? (i dont wanna leave my address) im at the top part of it near the 7-11

Bill_Cooke: Look up.

breezybri13: Saw a couple of really quick, faint ones in Warner Robins, Georgia. And an airplane...

Bill_Cooke: Congrats!

Savannah_Lynn: Where is the live feed from? :D

Bill_Cooke: Huntsville, Alabama.

Jay: Is it possible to see them from Brooklyn?

Bill_Cooke: If you can see the stars in the Big Dipper, you can see Perseids.

simon.f: Can you still spot the meteors if you are in a backyard or lit area?

Bill_Cooke: You need to be able to see the stars in the Big Dipper.

JUniorpm: whats the best view direction from miami fl. thanks

Bill_Cooke: Look up away from the moon.

Vanillapup: which direction are they going ot be coming from?

Bill_Cooke: They will appear to come from the Constellation Perseus in the northeast.

Many: what time can i be able to see the meteor shower in upstate new york?

Bill_Cooke: 3 a.m. to dawn.

EmeraldBot: Is the live camera rotating, by any chance? Or is it just me?

Bill_Cooke: The Earth is rotating, which causes the stars to move out of the field-of-view.

Shaun: Are there metoero showers that happen unexpectedly.. or is there a season for them?

Bill_Cooke: Yes, but no specific season.

Spwee: What are the dates for the Geminids?

Bill_Cooke: December 13th and 14th.

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Rhiannon_Blaauw: A nice double meteor was seen in the ustream feed about 15 minutes ago. See a picture of them here: <https://www.flickr.com/photos/nasamarshall/14903212612/>

rocknerd314: What are the names and times of the most prominent meteor showers?

Bill_Cooke: Geminids in mid-December, Perseids in mid-August, Quadrantids in early January, Orionids in October, Eta Aquarids in early May, Lyrids in early April.

many: what time can i be able to see the meteor shower in upstate new york? Your question has been submitted to the moderator?

Bill_Cooke: If the sky is clear, the peak rates will be between 3 and 4 a.m.

H: Can I see it in Dallas, Texas

Bill_Cooke: If your skies are clear and there is not much light around.

Katiena: What constellation is visible on the live feed?

Bill_Cooke: Draco.

amogh_k: Is it still possible to see meteors if the sky is cloudy?

Bill_Cooke: Can't see meteors if the sky is cloudy.

Zlxvzlx: until what time will I still be able to see the shower? Hoping that it stops raining in manhattan..

Bill_Cooke: You'll be able to see Perseids over the next few days.

Sajani: how fast are the meteors?

Bill_Cooke: Perseids move at 132,000 miles per hour.

DerpTurtleDonut: Do you really enjoy being part of NASA? And if you do , whats the most fun thing you like about it?

Bill_Cooke: Yes, I do. I love being part of an organization that explores space.

JUniorpm: Thanks Bill for your time answering our questions..... :)

Bill_Cooke: You're welcome.

Natfff: can u see from ca

Bill_Cooke: Yes.

Brooke_Moderator: Great questions still coming in...thanks for these!

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wa989898: What are the main differences between meteors and asteroids?

Rhiannon_Blaauw: A meteor is the streak of light caused from the particle, a meteoroid is that particle in space. The difference between a meteoroid and asteroid is size. An asteroid is generally a boulder-size or larger rock.

Nat: When can I see it in marietta ga?

Bill_Cooke: 3 a.m. to dawn.

Pia: will I be able to view from my window/

Bill_Cooke: No, you need to go outside.

DerpTurtleDonut: Isnt Earth Beautiful as well as the galaxy?

Rhiannon_Blaauw: The Earth is very beautiful! Just got back from visiting Mammoth Caves in Kentucky. Absolutely gorgeous - 400 miles of underground caves.

Darrell: i have not seen nothing in kentucky yet ?

Danielle_Moser: Sorry to hear it, Darrell. Meteor shower observing takes a lot of patience. Keep at it!

rocknerd314: How big are the Perseids? Do you know how big the largest one is expected to be?

Bill_Cooke: About one millimeter. The biggest ones are baseball-sized.

Mrsmcgraw: i am in Los Angeles....will i be able to see it anyway or are the city lights to bright to see the shower

Rhiannon_Blaauw: You should be able to see the largest particles, though having a bright moon as well as city lights is not ideal. If you can get out of the city, that would be better.

lebron23: if I am in CA,should i start watching now?

Bill_Cooke: You should start seeing some Perseids.

Patrick_Henry: Do you guys get paid commision for all the questions you answer

Rhiannon_Blaauw: Haha. Nope. This is something we do for the public because we enjoy it.

Brooke_Moderator: Check out this beautiful and bright meteor seen just a few minutes ago!
<https://www.flickr.com/photos/nasamarshall/14716982260/>

Pia: saw 2 shooting stars tonight

Danielle_Moser: Great!

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savvi515: if meteorites are made up of rock and ice. have we ever found a meteorite that still has ice on it? or would it have completely melted by the time it went through the atmosphere?

Bill_Cooke: No, the ice is completely gone.

Tikerkub: Will the rain in the East Coast prevent me from seeing the showers?

Bill_Cooke: If it's raining, you won't see meteors.

simon.f: When will the peak time be for south east Tx?

Bill_Cooke: 3 a.m. to dawn.

wa989898: How many space rocks does NASA own?

Bill_Cooke: I have no idea. Lots.

Juanseper: i am in argentina can i see something?

Bill_Cooke: Check out the map here: <http://www.nasa.gov/watchtheskies/perseids-2014.html>

Henry_Nguyen: In the Live Stream, which Constellation is the video showing?

Bill_Cooke: Draco

rocknerd314: If the meteors are so small, how have they survived?

Bill_Cooke: It's pretty cold in space, so ice survives unless it passes close to the Sun.

Katiena: Why do all of the prominent showers end with "ids"?

Danielle_Moser: That was just the naming convention chosen - blame Latin, lol! The general rule is that a meteor shower is named after the constellation that contains the radiant using the possessive Latin form. From the IAU: The possessive Latin name for the constellations end in one of seven declensions: -ae (e.g., Lyrae), -is (e.g., Leonis), -i (e.g., Ophiuchi), -us (e.g., Doradus), -ei (e.g., Equulei), -ium (e.g., Piscium), or -orum (e.g., Geminorum)

Angelstar: Can you tell me the name of one or two stars on live feed. Is it a view of Ursa Major?

Rhiannon_Blaauw: The view is mostly of the constellation Draco. But also some stars in Cygnus are seen in the top left of the field-of-view. Currently the bright star in the bottom middle of the FOV is Altair.

Nat: how often does a meteor shower happen?

Bill_Cooke: Major ones happen about every other month.

Tikerkub: Is there a danger to the Intl. Space Station or satellites during this meteor shower?

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Bill_Cooke: International Space Station is armored, so no.

Gary_Bell: I've seen 4 meteors on the live stream in the last few minutes. It may be time to go outside!
ha

Rhiannon_Blaauw: Hi Gary! Yup - I think things are picking up on the live stream.

wa989898: Are there known meteor showers visible, say if we were on Mars?

Bill_Cooke: Mars does have meteor showers, but I don't know the dates --- don't live there.

Musicislife97: When is the next major meteor shower supposed to occur?

Bill_Cooke: The Orionids in October.

Gob: The perseids happen annually basically because it's a meteor field or something that Earth passes through?

Rhiannon_Blaauw: The Perseids happen annually because that is when Earth passes through the debris stream of comet Swift-Tuttle.

le_bob: how hot do the meteors get while entering

Danielle_Moser: Thousands of degrees Kelvin

SamN2000: Where can I see the Live Stream?

Danielle_Moser: Below the chat window or at <http://www.ustream.tv/channel/nasa-msfc>

Davidmexico: can I see the meteor shower in Oaxaca, México?

Danielle_Moser: Yes, if you've got clear skies and aren't blinded by city lights

Savannah_Lynn: Do meteor showers look cooler from the satellites?

Rhiannon_Blaauw: Meteor showers can be seen from spacecraft orbiting the Earth by looking down instead of up. And they look very cool! The cover picture of our Facebook page is a Perseid seen by the ISS a few years back. [facebook.com/NasaMeteorWatch](https://www.facebook.com/NasaMeteorWatch)

Brooke_Moderator: Another great meteor captured a few minutes ago on the live feed!
<https://www.flickr.com/photos/nasamarshall/14903700395/>

Twistedad: what kind of computers do you use at NASA and what are the specs ?

Danielle_Moser: All sorts actually. Kind of a hard question to answer!

Mosster1: You're doing a great job here, Admin Bill_Cook. Just thought you would wanna know. Right on

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Bill_Cooke: Thank you.

StarBot: Could the perseids cause any trouble? perhaps crashing into earth or harming something important?

Bill_Cooke: Nope. Burn up fifty miles above your head.

Pia: How many shooting stars are there (approx.) per day

Bill_Cooke: No idea.

Patrick_Henry: Would one be able to see the showers with low to very mild cloud coverage?

Bill_Cooke: Doubt it.

Vanillapup: are they too fast to catch them on camera? i havent seen any yet but this is just for future refresces

Rhiannon_Blaauw: The live-feed will show meteors as streaks. You should be able to see the bright ones. For example, this meteor was seen minutes ago:

<https://www.flickr.com/photos/nasamarshall/14903700395/>

le_bob: Is there a chance that the meteors reach the surface of the earth without disintegrating?

Rhiannon_Blaauw: All Perseids will burn up by about 50 miles above the Earth's surface.

Sebas: hello can be seen in Ecuador and what time please

Bill_Cooke: Around 3 a.m. local time, but you are so far south you will see very few Perseids.

Linda_and_Javon: Aren't meteorids and shooting stars the same thing??

Danielle_Moser: Meteors and falling stars are words used to describe the same thing -- the streak of light created when the space rock "burns up" in the atmosphere. A meteoroid is the chunk of rock/ice in space.

Mosster1: For the record ... all the Admins on here are doing a great job. Thank guys.

Rhiannon_Blaauw: Thanks so much for the feedback. :-)

Help_me_: i live in calirfoina iv been wait i dont see anything hat will it look like?

Danielle_Moser: It'll look like a quick streak of light. Are you observing outside or on the Ustream? If you are observing in California you should see the best rates between 3 and 4 a.m. your local time.

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CPayes34: i am learning so much by reading these questions and answers! thanks to all of you taking the time to do this! and Bill is awesome

Danielle_Moser: It's our pleasure. (Bill IS awesome, lol!)

Robert: I'm confused, why all the attention tonight, a day after the normal August 11-12 peak???

Bill_Cooke: The peak this year is August 12-13.

Investigador: 3:00 AM MEXICALI HOURS??

Bill_Cooke: Yes, 3 a.m. Mexicali.

Neil: Should we be looking in a particular direction?

Bill_Cooke: Look up away from the moon.

le_bob: What temperatures are the meteors when they break the atmosphere?

Bill_Cooke: They reach temperatures of about 2000 degrees Celsius as they burn up.

Patrick_Henry: Is there a representative I can contact to try to persuade that you admins get paid commission for each question you answer?

Bill_Cooke: Nope, we work for the government.

giac12: hi everybody, I'm from Perú, how is going to be the visibility and what time will be the best time to see?

Danielle_Moser: You can see some Perseids but not many from Peru (see <http://www.nasa.gov/sites/default/files/files/perseids-viewing-2014.png>) . Best visibility is still approx between 3 a.m. and 4 a.m. in your time zone.

breezybri13: I heard someone say that instead of an asteroid killing off the dinosaurs, it was a UFO and we are the aliens. any comments?

Bill_Cooke: Nope, no comments.

Zlxvlzcx: What makes the meteoroid pick up that speed? Talking about 132,000 miles/hour!

Rhiannon_Blaauw: The meteoroid is travelling very fast based on the speed at which the debris comes off Swift-Tuttle, and any additional energy due to planetary perturbations. Additionally Earth's gravity pulls it in which increases the meteoroid's speed.

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Aleksin: Can I ask? How long that comet tale? I mean we pass through that every year in the same time, how it's possible? Our orbits are cross, or tale of that comet so huge and stay in the same position relative to the Earth. Sorry for my English again.

Bill_Cooke: We are nowhere near the tail of Swift-Tuttle.

Birdman26: have you ever been to the iss?

Rhiannon_Blaauw: None of us are astronauts. ☺ So no, we have not been to the ISS.

B: Are you planning to watch the shower at 3am your time?

Danielle_Moser: If I can keep my eyes open, lol!

Pia: When will NASA have volunteers go to Mars?

Bill_Cooke: I don't know. Do you want to volunteer?

Pia: I went outside I saw a couple shooting stars

Rhiannon_Blaauw: Fantastic!

Musicislife97: It's really cool just to be chatting with all you admins! Great job guys! :)

Bill_Cooke: Thank you.

Llama: How clear does the sky need to be? Can I see perseids at "partially cloudy" and ~20 mags/arcsec outside of the city?

Bill_Cooke: You need to be able to see the stars in the Big Dipper.

nich0lasram: I'm curious from Vancouver, BC, Canada. Where is the best direction to look? It is a bit cloudy, but I can still see the North Star.

Bill_Cooke: Look up away from the Moon.

Help_me_: please help if i stay outside and wait will i see? one how long u think esamit?

Danielle_Moser: You may see some Perseids, but it will take some patience. And you shouldn't keep going between observing the sky and say, the bright lights of your computer screen. You want your eyes to adjust to the dark.

tdmak63: Hello All! I am in Indiana and have seen a few. Stunning!!! I truly enjoy the live-feed and all of the informative dialogue. Thanks! :)

Danielle_Moser: Thanks for joining us!

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Robert: Bill, it is well documented when the Perseid peaks which is 11-12, how can this be different on this year?

Bill_Cooke: Go to <http://www.imo.net> for an explanation.

le_bob: Around what temperatures do the Perseids go up to when entering the atmosphere?

Rhiannon_Blaauw: In space these particles are very cold. When burning up in the atmosphere at 130,000 pmg, they are very hot (on order of 2,000 -6,000 degrees Kelvin).

Musicislife97: Why aren't the time zones all over the world a factor in watching the meteors/

Bill_Cooke: Because the Perseid peak is so broad that the radiant altitude in the sky is more important than the time zone.

potatoe: Can it be seen in the Bay Area in California or is it too cloudy ?

Bill_Cooke: Don't know --- I'm not in the Bay Area. If it's cloudy, you're not going to see Perseids.

Sebas: hello can be seen in Ecuador and what time please

Danielle_Moser: It can be seen from Ecuador, but the number of meteors per hour will be low. You can observe between 03:00 and 04:00 in the morning.

schismal: was so disappointed when it started raining today where I am. Thank you so much for the livestream and for the livechat!

Danielle_Moser: The rain is so inconsiderate, lol! Hope you learned a lot!

nich0lasram: In the Ustream below, have any Perseids been shown?

Rhiannon_Blaauw: Yup! Some Perseids but also other background meteors. We have posted some pictures of the meteors seen to our flickr account:

<https://www.flickr.com/photos/nasamarshall/14903700395/>

Veronica: will i be able to see this out my window? there are a couple of lights out

Danielle_Moser: If you turn out all of the lights inside and your field of view isn't marred by outside lights, you might be able to see a few of the brighter Perseids.

zta192: Do you guys just have "Look up and away from the moon" and "Best time is between 3 and 4 am local time" copied and ready to paste all the time? :P

Bill_Cooke: Yes.

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Inspector_Gadget: Could a comet be so cold that when it's entering the Earth's atmosphere, the temperature of the comet entering through the atmosphere balances out to 0 to the temperature of the atmosphere?

Bill_Cooke: No.

billybobb80: so central time zone 3 to 4am is the best time to look?

Bill_Cooke: Yes.

Patrick_Henry: How can you guys determine how fast a meteor is going is it through a bunch of hypothesis then coming to a conclusion or is there a machine or radar of some sort you guys clocked the speed at?? Yall are awesome my little young one is learning much from these questions and answers.... you guys really need commision pay for being ontop of things...

Rhiannon_Blaauw: Thanks for the feedback. I'll tell Dr. Cooke that he should be paying us commission. ;-) (jokes) We know the meteor's velocity from observing the same meteor from cameras at different locations. We use triangulation (because we can see which stars are behind the meteor from different locations) to determine the meteor's trajectory, orbit, and speed.

Shaun: It has been Cosmic watching the chat and the stars.... Good night ladies and gents.... finally got the kids to stay in bed... now its my turn.

Rhiannon_Blaauw: Thanks for joining us!

Inspector_Gadget: How do you guys know if the meteors you see are Perseids and not "other" ones?

Bill_Cooke: Perseids appear to radiate from Perseus and they move about 132000 miles per hour; that's how we know they're Perseids.

Birdman26: alright. i cant keep my eyes open. thank you for the anmazing information, and thank you for staying up so late . thanks for the livestream also because it is cloudy here

Bill_Cooke: Sleep well!

Itiskanika: Is the live stram by NASA a good place to look for the showers if I can't from my location?

Bill_Cooke: As good as any.

aleksin "Bill_Cooke - We are nowhere near the tail of Swift-Tuttle." Does this mean we see extremely small part of all pieces that falls off from the Swift-Tuttle? And where Swift-Tuttle going?

Bill_Cooke: We are seeing pieces of the comet left behind in the orbit. And for the current position of Swift-Tuttle, go to the JPL Small Body Database.

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Gloria I'm in Eastern time zone, is it still 3-4am?

Bill_Cooke: Yes.

Superbaz: I'm not even sure which direction to look. :P

Bill_Cooke: Look up away from the Moon.

Samuxxx: so... im in Panama...at what time do i get to see them ?

Bill_Cooke: 3 a.m. to dawn.

Elponch: what does the counter in the Ustream video means? the number of perseids views? or only video watchers counter?

Bill_Cooke: How many people are viewing it.

Help_me_: so wil any time be good to go out adn look at them? and wait?

Bill_Cooke: Sounds like a plan.

Centereye: where is Perseus in the camera view

Bill_Cooke: Perseus is not in the camera view. We are looking at the Constellation Draco.

Superbaz: I know away from the moon, but there's gotta be a certain direction in general.

Rhiannon_Blaauw: In general, look up. Take in as much of the sky as possible. Because of the bright moon tonight, you just don't want to look directly into the moon.

Schism: Will there be a transcript of this livechat available to refer to at a later time/

Rhiannon_Blaauw: Within a few days a pdf of the chat will be posted.

Priscylla: Today is my birthday, and I'm eagerly waiting to see the meteors here. I'm from BRAZIL. I'm in the area with low rates of visibility. What time is it there now? I'm confused with the time difference.

Rhiannon_Blaauw: Happy Birthday! Just look for the Perseids at 3-4 a.m. local time (the hours before dawn). Hope you see some!

Robert: Bill, "altitude in the sky", LOL. Sorry, but that makes no-sence to me. The real day of the peak, at the same time of night, would only be a few degees different, 3 if I recall. Please try explaining again.

Bill_Cooke: The radiant altitude is highest at 3 to 4 a.m. For example, if you are in latitude of 32 degrees, the Perseid radiant will be roughly 64 degrees altitude. This influences the rate far more than your time zone on the peak day. The higher the radiant, the more Perseids you will see.

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Queach: Whats the best snack to eat while watching the perseids

Bill_Cooke: Chocolate chip cookies.

Saber008: Can't see anything here...it's raining :(

Bill_Cooke: Sorry.

Barronsbaubles: Thanks for taking the time to answer questions! My students love to see this kind of stuff. See you at the next shower! ;)

Bill_Cooke: You're welcome.

Sajani: i think i just saw one! finally :) :) thanks a lot guys

Bill_Cooke: Congrats!

Musicislife97: What is the most popular meteor shower of this coming year?

Bill_Cooke: Probably the Geminids.

breezybri13: how come some of the meteors are faster on the livestream than others?

Bill_Cooke: The Perseids are the fast ones. Background or sporadic ones are the slower ones

wa989898: What is your favorite part of working with NASA?

Rhiannon_Blaauw: So many great parts of working for NASA. It really is a dream job. I'm still relatively young in my career, and I have found that there are so many people at NASA willing to teach me new skills and grow me as a scientist. I enjoy the variety of my projects, interacting with the public (like through events like this!), meeting other scientists, and many other aspects.

Elponch: Bill, what time is in your city?

Bill_Cooke: Just past 1 a.m.

Inspector_Gadget: Bill is there a term of binary comet systems? In other words, comets orbiting each other. Or are their gravitational pulls too weak?

Bill_Cooke: I know of no binary comets. Binary asteroids, yes.

JB1029: Can I view the Meteor Shower in Fresno, CA?

Bill_Cooke: Yes, if your sky is clear.

MagicRice: Beautiful skys here in Kentucky, I've been lucky to catch quite a few! Still, the light pollution is bad here sadly..

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Bill_Cooke: Congrats!

A: When would be the best time to watch in Gulf Shores, Alabama?

Bill_Cooke: 3 a.m. to dawn.

Pia: Whats the Geminids?

Bill_Cooke: The Geminids are pieces of an asteroid called Phaethon that the Earth encounters in mid-December.

SirPent: What is the current 'meteor rate per hour'??

Bill_Cooke: According to the IMO, about 50 per hour.

JNK: Should I be looking at the direction of the Perseid or any direction that is dark enough would be fine?

Bill_Cooke: Any direction that is dark is good.

JT: If this a meteor shower is there a meteor storm and if so when can we see 1 of those?

Bill_Cooke: You are going to have to wait a while for a meteor storm.

elponch: Bill, what about change the music, maybe something more relaxing could be better for the waiting :D

Danielle_Moser: I'm afraid more relaxing music would put us to sleep at this hour!

Davidmexico: which one is the biggest meteor shower have you ever seen?

Bill_Cooke: 2002 Leonids.

lebron23: The next major meteor showers are in oct correct?

Bill_Cooke: Yes, the Orionids are in October.

alexander_kirschner: So the live chat only goes till 2am your time, but the livestream goes till dawn. Correct?

Bill_Cooke: Correct.

Autumn: When is the best time to look?

Danielle_Moser: Between 3 and 4 a.m. in your local time zone.

SwagMasterDrew: Hi

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Danielle_Moser: Welcome!

StarBot: Me and my Dad are about to go look for some, got any helpful tips BESIDES dont look at the moon?

Bill_Cooke: Be sure to bring mosquito repellent.

Musicislife97: I'm going to be the next astronomy club president at my high school any ideas for watch parties or activities?

Rhiannon_Blaauw: Congrats! The Perseids and Geminids are two fantastic meteor showers to have viewing parties for. Viewing planets through a small telescope is always fun. There is a partial solar eclipse (if you are in the right region of the world) in October. There is a conjunction of Venus and Jupiter in a few days. Just a few ideas. ☺ Hope it is a great year!

Saber008: Where is the live stream camera set up at?

Bill_Cooke: Huntsville, Alabama.

Grldatpiksupstyx: Where is the [ustream] camera location at?

Bill_Cooke: Huntsville, Alabama.

Greg: Can you predict when the next really epic meteor showers are going to be, similar to what you described in a previous question where there were 150,000 per hour?

Danielle_Moser: I don't know about anything epic, but the Perseids in 2016 should be a pretty good show.

Queach: what is the chance of a perseid reaching earth without burning up completely?

Bill_Cooke: Zero.

Superbaz: Any planet killers coming close soon? :P

Bill_Cooke: I hope not.

Inspector_Gadget: Would you guys wait or switch cameras if it was cloudy?

Danielle_Moser: You mean for the live feed? We run it from Huntsville where the cameras (and our team!) are located. So if it's cloudy we're out of luck. (We do have other cameras elsewhere in the US, but we don't live stream from them. Check out fireballs.ndc.nasa.gov)

1 2 3: can i watch the shower in San Francisco?

Bill_Cooke: If the sky is clear.

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Queach: so you're saying I won't find any cool space rocks in my backyard tonight?

Bill_Cooke: Correct.

Jim: have you ever caught a ufo on that cam? :p

Bill_Cooke: Nope.

Karan: Well which constellation are we viewing in the live stream? Perseus (sorry if mis-spelt)?

Bill_Cooke: Draco.

nich0lasram: What are your best tips for finding/looking at a perseid?

Bill_Cooke: Look up away from the Moon.

sankha: Hi! I am at University of Florida. 3 am is the correct time for me right??

Bill_Cooke: Yes.

Hiyin: Around wht time do you expect it to hit in the Atl area?

Bill_Cooke: 3 a.m. to dawn.

MaZIU: can i go to bed?

Bill_Cooke: Any time you feel ready.

Ulysses: I love you all.

Danielle_Moser: We love answering your questions (and observing meteors, of course). ☺

Brooke_Moderator: Another pretty meteor, seen a short while ago over Rosman, North Carolina:
<https://www.flickr.com/photos/nasamarshall/14900823301/>

Rocky: Are any of you fine people astrophysicists? I am aspiring to be one

Danielle_Moser: We've all studied astrophysics. Good luck to you!

Freestumach: what time will it be in the rapid city SD area?

Bill_Cooke: 3 a.m. to dawn.

Kllrshrkr: Anyone know if DFW area will get a nice view?

Bill_Cooke: If your sky is clear.

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Warthog: hi I am taking a flight that leave DFW at 6 am those meteros wont hit my plane or cause a prob will they?

Bill_Cooke: I think you're going to be pretty safe.

Darrell: What with some of the silly names for the comets?

Danielle_Moser: Comets are named after the people or instruments that discovered them. Comet Swift-Tuttle was discovered independently by American astronomers Lewis Swift and Horace Tuttle in 1862.

amr0924: So the best time to view the shower in Southern California specifically the Corona area is at 3 am?

Bill_Cooke: 3 a.m. to dawn.

Batgyu: can it be seen in florid

Danielle_Moser: Yes, the shower can be seen from Florida if you have clear weather.

le_bob3124: How fast does the comet that the Perseids are coming from travel?

Bill_Cooke: Depends on where it is in its orbit. The speed varies with distance from the Sun.

Asharma: What is the best place to see it around Sunnyvale, CA ?

Bill_Cooke: Somewhere away from city lights.

SwagMasterDrew: How's Space?

Bill_Cooke: Cold and empty.

EmeraldBot: If something as large as the Chicxulub Meteor were to break apart into many tiny fragments as it entered the Earth's atmosphere, what do you think it would look like?

Bill_Cooke: I have no idea.

Wwwwy: what is the time for watching at San Francisco?

Bill_Cooke: 3 a.m. to dawn.

Asharma: What is best time for viewing in Northen california ?

Rhiannon_Blaauw: 3-4 a.m. local time.

Vipin_Goel: can we see them in Los Angeles?

Bill_Cooke: If the sky is clear and you are away from downtown LA.

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Manoj: Another hello from Dallas Texas :) Am just waiting for 3 AM. I cannot identify any meteors for now

Danielle_Moser: Good luck! If all else fails, check out our fireball results tomorrow morning. Go to fireballs.ndc.nasa.gov, click the link for 20140813 (it'll appear tomorrow) and check out the videos!

RK: Hi..there's speculation goin on that Mars would be closest to earth on 26th August..it would look as big as moon...is dat true?

Bill_Cooke: Mars will never, never, never look as big as the Moon.

Musicislife97: What is your favorite part of a meteor shower?

Bill_Cooke: Going to sleep afterwards.

Twane: Will i be able to see the shower from Jamaica

Bill_Cooke: If your sky is clear.

Robert: Bill, are you working on a reply to my last question?

Bill_Cooke: Someone else must have gotten your question.

le_bob3124: Have spaceships been troubled/damaged by meteors in the past?

Rhiannon_Blaauw: Yes. It is one of the main tasks of the Meteoroid Environment Office (MEO) (that's us!) to create and improve models that predict the risk from meteoroids to spacecraft, in order to help spacecraft designers know how much shielding to build into the design, as well as to help spacecraft operators know when to perform risk mitigation strategies.

Amy: To capture the most metors with a 10-minute exposure, I could use my 35mm lens at f/1.4, or I could use my wider 17mm lens but it only opens to f/2.8. Any idea which lens would get the most meteors? Should I go with the wider viewing / focal length, or wider aperture?

Bill_Cooke: Wider field of view is usually better.

Bonnie: Saw a total of 7 this evening in SW Wisconsin (from 11:30pm-1am--not watching continuously). Very chilly tonight here, but clear.

Bill_Cooke: Nice.

Inspector_Gadget: Bill how many meteors did you see?

Bill_Cooke: Tonight? None --- I'm too busy answering questions.

amr0924: if im in a residential area do you think ill still be able to see the shower?

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Bill_Cooke: If you can see the stars in the Big Dipper, you should be okay.

Sankha: So I am wondering if you are still working on the average meteor observation rate per hour from Gainesville, FL??

Bill_Cooke: About 20-30 per hour just before dawn, assuming you are away from the lights of UF.

StarBot: You guys are good, you deserve a cookie for all the awesome work you do to the world and how you change it.

Bill_Cooke: We have cookies. Chocolate chip, as a matter of fact.

Annabelle: will i be able to see the meteors from los altos?

Bill_Cooke: Do you mean Los Altos in California? If so, yes, if you have clear skies.

le_bob3124: will the perseids be visible from the same locations when they return next year?

Rhiannon_Blaauw: Yup. Same locations and same time next year. Earth will pass through the same debris stream as it is currently passing through.

Robert: Bill, here it is again. Q: The "radiant altitude" would have hardly changed but a few degrees in only one day? We either pass thru the denser part of the comet's tail on the 11-12, or everyone seems to be rewriting science books on this 2014 show.

Bill_Cooke: The radiant rises at 15 degrees per hour, just like any star, so the altitude of the radiant changes throughout the night. And as far as the date of maximum, there is no rewriting of science books, unless you are talking about those geared for first graders. It is well-known by meteor scientists that the Perseid maximum can occur any time between August 11 and 13. In the past, the maximum occurred even earlier in August when the shower was known as the "Tears of St. Lawrence."

breezybri13: Are y'all having a big meteor shower slumber party?

Bill_Cooke: No. but we do have cookies.

Many: Bill What am I going to actually be looking at? what are the meteor made of?

Rhiannon_Blaauw: Ice and dust. You will be seeing streaks of light caused from particles millimeter or centimeters across. The streaks of light are much larger than the particles themselves.

Thuanisawesome: How can I become an astronomer?

Bill_Cooke: Lots of math and physics, Bachelors degree, Masters degree, Ph.D.

Linda_and_Javon: So from what I understand the best time regardless of where you are is going to be between 3am and 4am if you are in the United States correct?

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Bill_Cooke: That is correct.

alexander_kirschner: I've learned so much from this Live Chat. Thanks guys!

Bill_Cooke: You are more than welcome.

Inspector_Gadget: Have you guys met any famous people? Scientists/astronomers/Stephen Hawking?

Rhiannon_Blaauw: Dr. Bill Cooke has met Neil Degrasse Tyson. ☺ We get to meet astronauts fairly frequently.

space_be_ballin: is it fun working in the MEO?

Bill_Cooke: Yes.

anaherrera98: time for watching in texas?

Bill_Cooke: 3 a.m. to dawn.

awab12345: can i see the meteor from stream valley lane in nyc?

Bill_Cooke: If the sky is clear.

Sgdh: Did I miss the meteors? Will it be visible from the Valley here in California???

Bill_Cooke: 3 a.m. to dawn. If you skies are clear.

StarBot: Can you drop some of those chocolate chip cookies from your space shuttle? I am craving for some 3=

Bill_Cooke: Don't have a shuttle and the cookies are mine!

Yru: I'm in Peru. Will i to see the meteors? Kisses.

Bill_Cooke: Very few.

breezybri13: I'm studying to be a middle school science teacher. I have two more lab science credits left. is it a smart idea to take astronomy as an online course?

Bill_Cooke: I would think so.

zta192: Do you guys to live chats for every meteor shower?

Bill_Cooke: Nope. Just for Perseids and Geminids.

Coolrigs: So, I underand that the debris is being burned by Earth's atmosphere as it passes through it. Has any piece of debris every landed on Earth? How large is the largest debris that we burn up?

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Rhiannon_Blaauw: Yes, debris has made it to earth. Not from the Perseids, but other meteors. If the debris makes it to earth, it is considered a meteorite. Debris that is meters across can completely burn up in the atmosphere. It is highly dependent on the composition of the debris, the speed, the angle, etc. So it is hard to say exactly.

Sankha: How do I know that I am looking at the correct part of the sky? In other words which part of the sky gives me the most probable meteor view??

Bill_Cooke: Just look up. There is no preferred direction if you avoid the moon.

Musicislife97: What is your favorite meteor shower of the year?

Rhiannon_Blaauw: The Perseids. ☺ Mostly because it is warm in August which makes it easier to observe them!

fdo5: hi guys, time for watching in colombia, south-america??

Bill_Cooke: 3 a.m. to dawn.

CL: Saw about half dozen over night sky in Iowa.

Rhiannon_Blaauw: Fantastic! Love hearing good reports.

Ricardo: time for watching in Colombia?

Bill_Cooke: 3 a.m. to dawn.

DJCleptic: What is the Difrence between Perseids and Geminids?

Rhiannon_Blaauw: Perseids are from comet Swift-Tuttle, and Geminids are from the asteroid Phaethon. Earth encounters the debris from each of those bodies at different time of the year (August and December).

Brooke_Moderator: For those asking what direction to see the Perseids...our astronomers always advise looking straight up to allow your eyes to take in as much sky as possible. Give your eyes 30-45 minutes to adjust to the dark. (Para los que preguntan qué dirección para ver las Perseidas ... nuestros astrónomos aconsejan siempre mirando hacia arriba para permitir que sus ojos a tomar en tanto el cielo como sea posible. Dar a sus ojos 30-45 minutos para adaptarse a la oscuridad.)

Robert: Bill, that was my next question. Since the unknown printing of my science books, can the differences in the earths revolution each year cause the showes to shift their peak times and now a day has been added? This seems to be what you are implying.

Bill_Cooke: It is not because of the Earth's revolution, it is because Jupiter's gravity perturbs the debris stream.

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lolla12: there is full moon right above, is this going to affect the visibility greatly?

Bill_Cooke: Yes, you will only be able to see the brighter Perseids.

Thuanisawesome: Have you ever been to space if yes, what is space like?

Bill_Cooke: No.

Sankha: Why is it called Perseid Meteor Shower??

Bill_Cooke: Because the meteors appear to radiate from Perseus.

Chandana: Should I look towards the moon or away from it?

Bill_Cooke: Away from it.

Oooff: Are the particles large enough to pose any sort of danger to orbitals? Does the ISS have to take any precautionary steps?

Bill_Cooke: ISS is armored.

DJCleptic: So let me guess, im in miami and the best time to start looking is 3am-Dawn?

Bill_Cooke: You got it.

Crafty: I am watching from Kansas with a lot of trees around, Do you think ill be able to see the Persieds?

Bill_Cooke: Need to be able to see lots of sky.

Ricardo: time for watching in Colombia?

Bill_Cooke: 3 a.m. to dawn.

Many: what is the difference between Quadrantids, Perseids, and Geminids? is there any major difference?

Bill_Cooke: They are different meteor showers, so yes, they differ in speed, origin, composition, etc.

Ariilovescats: what time can I watch in Brandon FL

Bill_Cooke: 3 a.m. to dawn.

Jaybig: did i miss the meteor shower?

Bill_Cooke: No.

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Jaybig: time for watching in Virginia?

Bill_Cooke: 3 a.m. to dawn.

Robert: ""perturbs the debris stream", wow, this is deep, and a much better answer than altitude, LOL. Will this remain peaking now on 12-13 for quite sometime?

Bill_Cooke: It varies from year to year. I haven't checked exact times for next year. Plenty of time to do that.

Xylosma: Thanks for doing this live stream. Unfortunately it's a foggy night on the coast of Maine so I can't watch it outside.

Bill_Cooke: You're welcome.

Brooke_Moderator: Great composite image of meteors seen so far tonight!

<https://www.flickr.com/photos/nasamarshall/14717385119/>

lolla12: The articles that I have read stated to keep watch at 2:00 AM, is it only going to be visible from 3:00 AM to dawn ? or will I be able to see after 2:00 AM from Bartlett, IL?

Bill_Cooke: You can look at 2 a.m. if you wish

Perseid: i am in Kissimmee Florida, around what time will i be able to see the shower?

Bill_Cooke: 3 a.m. to dawn.

fdo5: if it's a foggy night here around, does your Ustream broadcast the shower at 3 a.m.?

Rhiannon_Blaauw: The Ustream will be on until sunrise here.

Jon: Thank you all for your time.

Rhiannon_Blaauw: Thanks for joining us!

Ariilovescats: Where would you recommend the best place be? I live in a pretty lit area. I'm worried I won't be able to see them

Bill_Cooke: Get somewhere dark.

Freddy: I'm in San Diego, California, can I still see the meteor shower?

Bill_Cooke: Yes, if your sky is clear.

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Sankha: You just told me that the meteors appear to be coming from there? Where do they actually come from?? And why do they come at this specific time of the year? Also why are these meteor showers so prominent??

Bill_Cooke: Why don't you Google "Perseid Meteor Shower"?

coolrigs: i'm in cupertino, california. when can i see it?

Bill_Cooke: 3 a.m. to dawn.

Xavi: what time can i watch in San Diego CA?

Bill_Cooke: 3 a.m. to dawn.

Musicislife97: When is the chat session going to end? Are you guys staying on for the long haul?

Rhiannon_Blaauw: Here for 23 more minutes. So if you have any more questions... send them our way!

Robert: Bill, "it varies from year to year", seriously, I've never heard that before. Very interesting to be able to ask a NASA expert, thanks for this opportunity.

Bill_Cooke: You're welcome.

Devileyes: what about in Alabama any been seen

Rhiannon_Blaauw: We have seen quite a few in the camera feed!

Ash21804: Since It's Raining Here In New Jersey When The Showers Start Will The Rain Have Anything To Do With The Meteors Fading Or Anything? Or Do They Only Fade Because They Hit The Earth's Atmosphere?

Bill_Cooke: Can't see meteors if it's raining.

Owen: what time does it start Pacific time

Bill_Cooke: 3 a.m. to dawn.

Penny: Do you know what the current time is in the Ustream?

Rhiannon_Blaauw: 1:38 am (CST).

Greg: What are most meteors made of?

Danielle_Moser: Meteoroids are made of ice and rock, and can include nickel and iron and other minerals.

Lola: will i be able to see it in Miami?

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Danielle_Moser: Yes, if you have clear weather!

TXcouple: When will I be able to see the meteor shower here in San Antonio, TX?

Danielle_Moser: You should be able to see some Perseids now, though the highest rates are expected when the radiant is highest in the sky (and the sky is dark), between 3 and 4 a.m your local time.

dfgdfg3455: Shooting stars are stars gone mafia.

Danielle_Moser: I'll have to remember that joke. 😊

Brooke_Moderator: Hello everyone -- we have about 20 minutes left in our chat so if you have a question, now is the time to ask.

Pthomas: I'm in Boise, Idaho. When and where should I be looking?

Rhiannon_Blaauw: Between 3 and 4 a.m. will be your peak time, but you can see Perseids after 10 pm local time. Go outside, lay on your back, and take in as much of the sky as possible, just try not to look directly at the moon. Give your eyes some time to adjust to the dark, and enjoy!

Gbshaik: If it's drizzling here in NJ we won't be able to see anything at all?

Bill_Cooke: If the sky is completely overcast, you won't be able to see them.

Mortikai: why is it so absolute? can you see if there is a little cloud coverage?

Bill_Cooke: If you have clear patches, you may be able to see Perseids in those.

Holmes: I haven't seen one yet here in MN....I'm trying to stay awake.

Danielle_Moser: *offers you some coffee*

Jaybig: what will the meteors look like? how will i know im seeing them?

Rhiannon_Blaauw: Streaks of light.

Weblog: I saw a few earlier but faint due to moon brightness

Danielle_Moser: Awesome!

pezzy28: will the meteor shower be going on tomorrow aswell?

Bill_Cooke: You be able to see Perseids tomorrow as well.

Sankha: I still dont understand why they are so frequent particularly at this time of the year?

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Rhiannon_Blaauw: The Earth is moving through a stream of debris left by comet Swift-Tuttle. We move through this debris stream every year in August.

Sina: Hi, In Seattle Area, we should wait until 3 am. Right?

Bill_Cooke: You can look any time. The peak rates will be around 3 a.m.

Linda_and_Javon: My grandson would like to know if you feel that there is other life forms on other planets out there??

Bill_Cooke: Probably.

fdo5: does the meteor shower already begins at some place?

Bill_Cooke: Yes.

Sankha: Thanks for answering my questions!

Rhiannon_Blaauw: You are welcome! Thanks for joining us.

TimM: Are there any fragments that survive the entry?

Bill_Cooke: Nothing of a Perseid can make it to the ground.

giac12: Helloa and thanks. Just do I have to see directly up to see the Perseids? or do I have to see in other degree direction? I'm from Perú, I suppose the moon at 3am is in north-west 50 degrees aprox.

Rhiannon_Blaauw: Take in as much of the sky as possible, without looking directly at the moon.

Musicislife97: Is the ustream camera still looking at Draco?

Bill_Cooke: Yes.

Inspector_Gadget: Do you guys have any motivational words for me if I want to become an astronaut?

Danielle_Moser: Paraphrasing here... the probability of success is difficult to estimate; but if you never try the chance of success is zero.

Gbshaik: how come the peak will be from 3-4 everywhere? Like shouldn't time differences change that

Bill_Cooke: Because the peak rates occur when the radiant is highest in the sky, which occurs at 3 a.m., no matter what your time zone is.

danmel14: Will you be able to replay the U-stream later today?

Rhiannon_Blaauw: The Ustream will be replayed during the day on August 13.

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Diamond_Dave: Are you all going to be answering questions and such Wednesday evening as well? Cloudy with scattered showers here in Calgary (most of Southern Alberta) right now, no show for me tonight.

Bill_Cooke: Nope. The chat is just tonight.

Srn: hi im srn and want to know what time is best to head out (aka kids sleeping atm) and want to show him this he loves looking at the stars with my telescope and thank you

Bill_Cooke: 3 a.m. to dawn.

Help_me_: How Long will it take to xsee One Or Your Guess? Please answer

Danielle_Moser: I'd suggest that you give it an uninterrupted half hour and see what you see.

Jessica: cloudy here in vancouver.

Danielle_Moser: Rotten luck! Hope you see some on the Ustream live feed.

le_bob3124: what will happen if 2 perseids collide midair?

Rhiannon_Blaauw: There would be a small explosion - that would be a lot of energy. However, that won't happen. These meteors are not close to each other in space - mostly because they are so small (mm or cm size).

JUniorpm: the camera in the live stream is pointing to the right position / or any constellation?

Danielle_Moser: It's looking at the constellation Draco

breezybri13: Thank y'all so much for answering my questions! Keep on being awesome! It's about to be 3 am so I'm gonna go stare at the sky! Peace out cool kids!

Danielle_Moser: You're very welcome! Hope you have clear skies!

Sankha: "the peak rates occur when the radiant is highest in the sky, which occurs at 3 a.m., no matter what your time zone is." What do you mean when you say the radiant is highest in the sky?

Rhiannon_Blaauw: The point in the sky that all Perseids radiate from which is in the constellation Perseus (that is how meteor showers are named). Thus, when Perseus is highest in the night sky for you, the rates should be highest.

Ash: would just normal street lights block my view?

Danielle_Moser: If they're shining right at you they might.

Spaceman42: I been watching for 10 minutes...Still no meteors..

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Danielle_Moser: Patience is key.

Ash: what's the coolest part of working for NASA?

Danielle_Moser: I think it's constantly being exposed to new things. And feeling like we're a part of something bigger and more important than ourselves.

Ash: If they are that tiny, how can we see them all the way over here?

Rhiannon_Blaauw: The ionization (which we see as light) spreads out much larger than the particle itself - in fact, millions of times larger. A mm-sized meteor creates ionization that spreads out wider than a battleship.

Mickeyy: i want to be a computer scientist. how camn i get into nasa?

Rhiannon_Blaauw: Look for internship opportunities - a great way to get your foot in the door.
intern.nasa.gov

Brooke_Moderator: We have about five minutes left in our chat...any further Perseids questions? This is the time to ask!

giac12: if the perseids are so small, how is posible we can see them? Is it becasue for their speed?

Danielle_Moser: It's true that Perseids meteors are small, but they pack a punch -- they've got a lot of energy traveling at 132,000 mph. When they "burn up" and ionize in the atmosphere they leave a long trail that can be seen from miles away.

Inspector_Gadget: Thank you guys! You have helped a lot. I have to go. It was fun chatting with you guys and thank you for answering our questions. GO NASA!

Danielle_Moser: Woot! Thanks for joining us!

Ash: are meteoroids and shooting stars the same thing

Rhiannon_Blaauw: Meteoroid is the particle in space. Meteor is when it is burning up in the atmosphere. A meteor and a shooting star is the same thing. Shooting star is just the common term. 😊

Musicislife97: This has been a fantastic learning experience, guys! Thanks so much for staying up with us tonight!

Rhiannon_Blaauw: Thanks so much for joining us!

Meteor: we just returned from our viewing and saw 20 in about an hour and a half

Danielle_Moser: That's awesome! I'm jealous!

Web Chat: Stay 'Up All Night' to Watch the Perseids 2014!
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batman...: i shouldnt have my laptop open right now right? light interference

Bill_Cooke: Probably not a good idea.

Ash: how come you're stopping?? :(

Bill_Cooke: Because it's close to 2 a.m. and that's closing time.

Ash: so is what i would see now in the sky a meteor or meteoroid?

Rhiannon_Blaauw: You see the meteor.

Amanda: Im not seeing many meteors here in Wyoming.Why is that?

Danielle_Moser: It takes a lot of patience. Give it some time and, if your skies are clear, you should see some. Remember that the Moon is washing out all but the brightest Perseids.

Linda_and_Javon: Thank you so much for the learning experience and taking the time to chat with us.

Rhiannon_Blaauw: Thanks so much for joining us!

Diamond_Dave: Thanks once again for all info tonight everyone. I hope to be chatting with you in December.

Rhiannon_Blaauw: You are so welcome! Enjoyed answering your questions. Hope you get to see some Perseids still tonight! ☺

Danielle_Moser: If you can see patches of sky with stars between the clouds, you might see some Perseids. But it'll be harder.

giac12: if it is not totally clear, and ther are some clouds, is posible to see the perseids?

Bill_Cooke: Geminid meteor shower on December 13.

pezzy28: what heppens in December?

Danielle_Moser: It was our pleasure. Happy viewing!

Sankha: Thanks a lot for answering the questions! I am off to see the meteors now!

Ash: if i'm watching the ustream, would peak time still be 3-4 my time?

Bill_Cooke: 3-4 a.m. Alabama (Central) time.

Ash: time difference between alabamba and ny?

Danielle_Moser: NY is 1 hour ahead of AL

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DianaGlzS: Good night guys! Sleep well, hope we can talk to you again some time soon

Danielle_Moser: Thanks for joining us!

Brooke_Moderator: Hello everyone! We're closing down our live chat and moderated comments, but the Ustream feed will run all night. The peak viewing tonight is 3 a.m. until about dawn, your local time. This is true for all time zones and locations in the world. Please look at the map above to see if your location is in a zone to see Perseids. You will need clear, dark skies to see Perseids, and it's best to look straight up, not in a particular direction. If it is totally cloudy or raining, you won't be able to see meteors. You can see Perseids for the next couple of nights, but at a much reduced rate from tonight's peak. Thanks for being here, and have a great night...and thanks so much to our experts: Bill Cooke, Danielle_Moser, and Rhiannon Blaauw. (And here's a video to close us out:

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