

NASA Chat: Stay 'Up All Night' to Watch the Perseids!
Experts Dr. Bill Cooke, Danielle Moser and Rhiannon Blaauw
August 11, 2012

Moderator Brooke: Good evening, everyone, and thanks for joining us tonight to watch the 2012 Perseid meteor shower. Your chat experts tonight are Bill Cooke, Danielle Moser, and Rhiannon Blaauw from NASA's Marshall Space Flight Center in Huntsville, Ala. This is a moderated chat, and we expect a lot of questions, so please be patient -- it may take a few minutes for the experts to get to your question. So here we go -- let's talk Perseids!

Boady_N_Oklahoma: Good evening!!

Rhiannon: Welcome! We look forward to answering your questions tonight!

StephenAbner: I live in Berea, Kentucky. Can you please tell me which part of the sky I should focus on for best viewing?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Victoria_C.: Because we pass through the cloud every year, does the amount of meteors decline in time, too?

Rhiannon: The meteoroid stream is replenished as the particles are travelling around the orbit of the stream. We will have Perseids for a long time still.

Jerrte: When will the Perseids end? What year will be the last to view?

Bill: The Perseids will be around for the next few centuries.

Victoria_C.: Why do meteors fall more on one night than different nights?

Bill: On certain nights, the Earth passes closest to the debris left behind by the comet. When this happens, we get a meteor shower with higher rates.

Boady_N_Oklahoma: I'm in central rural Oklahoma with crystal clear skies. My 12 year old is excited about tonight's show. Which direction will be best for us to watch the Perseids?

Bill: Look straight up.

Werz: Is the video quality going to be better? It's very grainy at the moment :(

Rhiannon: Hopefully it will become more clear as the skies darker. Unfortunately some noise is inevitable. We should still see many meteors through the field of view throughout the night.

Brandon: Is the shower possible to see on the eastern coast even though the cloudy sky?

Bill: Can't see meteors with a cloudy sky. Sorry.

MarsSMalo: what time central?

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Bill: You should start seeing Perseids after 10 p.m.

Scott_C_Palmer: Surely, the meteor showers can't go on forever. How long are the meteor showers expected to last before they reduce to nothing left?

Rhiannon: The Earth will pass through the stream by August 24th, though by far you will see the highest rates tonight. Tomorrow night you can see about half the rates of tonight.

LukeCC: Good Night!! 00:003 here on Brazil. So, we BRs should be looking wich direction? Because I wont be able to look in the horizon.

Rhiannon: Lie on your back and look up! Let your eyes adjust to the dark and enjoy. ☺

Bouchardfamily: We are in Southern Ontario (Canada) and I read that we shouldn't look straight up at the sky but only about halfway up and to the northeast (from where we are). Should we really be looking straight up? The skies here are beautiful and clear so we are pretty excited!

Bill: Look straight up. Avoid looking at the Moon. If you look to the northeast, the meteors will have shorter trains and not be as spectacular.

Talkingchickenscratch: What is the definition of a meteor shower? How does it actually happen? Is it lots of shooting stars?

Rhiannon: A meteor shower occurs when the Earth passes through the trail of debris left by a specific comet or asteroid. There are over 30 visual meteor showers per year.

Talkingchickenscratch: Hello! Thank you for being here to chat with us!

Rhiannon: You are so welcome. Thanks for your interest!

Scott_C_Palmer: Has anyone been able to test the meteoroids for their composition, are they carbonaceous or a mix of rock and ice?

Bill: Perseids come from Comet Swift-Tuttle and are probably made of bits of dust and ice.

gemini83: how does NASA know when we are entering the thickest part of debris field??? estimate? camera? radio waves?

Rhiannon: From years of data. We enter the thickest part of the meteoroid stream at the same time every year. The data is from cameras, radars, and other means.

Gold_Dude: Let's get this started. Is your camera pointed in the optimal direction? What is its Az and El so I will know where to best look? I am up against the background light from downtown Atl. I'm in directly east in Villa Rica.

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Bill: Our camera is pointed north just above Polaris to minimize interference from city lights, but this not the best direction to look.

Jerrte: Is the ISS crew monitoring the Perseids?

Bill: As far as we know, no, but they may take a few pictures.

KyliePatricia: Will viewing conditions be favorable in the St. Louis area?

Danielle: If you have clear (non-cloudy), dark skies - yes!

Vinoth: So no chance to see them in Philadelphia?

Bill: If it is clear and you are out of the city, you should see Perseids.

Moderator Brooke: Great questions coming in, and our experts are working to get answers for you. Sorry to hear that some folks have cloudy skies. Try our Ustream feed (embedded on this page) because we have nice clear skies over Huntsville/Marshall Space Flight Center tonight.

Lafefa: When it start of Central US time?

Bill: You should start seeing Perseids around 10 p.m.

jabenton87: Do you know the current number of meteors per hour?

Bill: About fifty, when I last checked.

Andres: How dense is the meteor cloud? Is it common for satellites to get hit by one?

Rhiannon: It is not common, though it is not unheard of. A Perseid hit the satellite Olympus in 1993 and it was unable to be used after that point. We at the Meteoroid Environment Office have models of the background and shower meteors so that satellite operators know how much protection to put on their spacecraft and which times of year to expect more/less meteors.

Heaven: Will I be able to see this in Orlando FL?

Bill: Yes, if the sky is clear.

LainP7: will the shower be visable with some city light polution?

Danielle: If you can see the stars in the Big Dipper from your location, you should be able to see Perseids, even with some city light pollution. It's best to get as far away as lights as possible, though.

Sblinde: At what points in the next few nights do you expect the meteor shower to have the most activity?

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Bill: I expect the most meteors tonight just before dawn.

SherryinCincy: How "wide is this view?

Rhiannon: The camera in the live stream is a low-light level video camera with a 25 degrees field of field. It is pointing north, just above Polaris.

Cha: how about pacific time?

Bill: 10 p.m. local time, no matter what your time zone. That's when you start to see Perseids.

Brandon: What time will the shower be able to be seen on the live feed?

Bill: The live feed is on now.

SpockvsData: I apologize for my previous one word question. As an amateur, how will I know w/o the aid of a compass the direction in which NorthEast is? I can't find my compass.... :\

Bill: The best thing to do is to look up towards the zenith. Do not look northeast towards the radiant.

Mea12: If I can see stars should i be able to see the perseids?

Bill: If you can see stars, you can see Perseids.

lakewood_ohio: Are any of the particles large enough to survive the descent through the atmosphere? Also, is there a history of any especially spectacular showers in the past 20 years or so?

Danielle: Perseids are too fragile and move too fast to survive to the ground, so no worries. Yes, we had great Leonid showers about a decade ago, and the Draconids last year weren't too shabby! ☺ As far as upcoming showers, the Perseids will show increased rates (an outburst) in 2016.

Sarkeny: Hi, thanks so much for hosting a chat for the public tonight! My questions: How are the Perseids any different than the Quadrantids? Also, how many times a year should we expect major meteor showers to take place around the earth?? Thank you.

Rhiannon: The Perseids are from pieces of debris that came off comet Swift-Tuttle. We pass through that debris every August. The Quadrantids are debris from another comet and we pass through that debris at the beginning of January. We can see over 30 visual meteor showers per year!

Bouchardfamily: Thanks so much! We're heading out with blankets, mugs of tea, and the kids that are still awake right now. Pretty cool being able to ask you questions right now, thanks :)

Danielle: Awesome! Have a great time! Thanks for joining us!

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Starsearcher: would i be able to see them past 3 am east coast time? I've noticed that the past few days its been cloudy during this time and then during the dawn hours it clears up

Bill: You will be able to see them up until dawn.

Yue: Why is the feed black?

Bill: We can see stars on the feed.

Kman: we have clear sky here in midwest - will we be able to see much?

Rhiannon: We hope so! You should be able to see them after 10 pm and the rates should be best between 3-4 am local time. Happy viewing!!

Lifelessdrifter: Im in Ky and we have no moon at the moment. Where am I surpose to be looking?

Danielle: You just want to look straight up, taking as much sky in as possible.

Derekh: it's cloudy for the next 24 hours here in Kildare Ireland - will the shower last beyond that?

Rhiannon: You will still be able to see Perseids 24 hours from now, though the rates will not be as high.

Randomkidsrule: Can the meteors come from any direction or do youlook towards the north?

Bill: They can appear any place in the sky. Look up towards the zenith.

Stacy: do you guys know if the meteor shower is visible to Chicago?

Bill: If it is clear and you can see stars, you can see Perseids.

Erikaaa: is there an 'ideal' time to watch? Will the show become more clear futher into the night?

Rhiannon: If your skies are clear, the best time to view would be between 3-4 am local time. We hope you see many!

Ben: What is the best time to view the meteors in the Caribbean?

Bill: After 10 p.m. local, regardless of time zone, and you will see the most meteors before dawn.

Z: Is every meteor shower caused by comet debris?

Rhiannon: Some are from asteroid debris! The Geminids in December are pieces of asteroid 3200 Phaethon.

tjones102: So you should not look toward the constellation Perseus?

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Danielle: No, you don't need to locate the constellation Perseus. It's best that you look just straight overhead, putting a large portion of sky in your field of view.

Starbuff: I've been watching the USTREAM Live video for the past half hour but have not spotted any meteors. Is it too early to sight them? (Time is now 11:10 pm.)

Bill: It's only 10:10 here, where the camera is located, and there will be very few Perseids until the radiant rises higher.

Steph: Do you know if Jacksonville, Florida will be able to see the meteor shower at any point tonight?

Bill: If you can see stars, you can see Perseids.

tjones102: I am in Kentucky, was out a few minutes ago, we have very clear skies, but haven't seen anything yet.

Rhiannon: Glad you have clear skies! The number of meteors should increase as time goes on, peaking between 3 and 4 am. Hope you see lots!

Scott_C_Palmer: Given their trajectory and speed, how hot do you think they get when entering the Earth's atmosphere?

Danielle: Several thousand degrees Kelvin!

PGC911: how long do the trails of a comet remain where the earth can pass through? Seem like after several passes, the trail would be gone.

Bill: The comet continuously ejects material each passage around the Sun, which replenishes the shower meteoroids.

RickGammach: Has there been any spectrographic analysis of meteor trails?

Bill: Yes.

Timinseattle: hi from Sunny Seattle

Danielle: Hello Seattle! Sunny -- that's unusual, isn't it? ☺

geminis83: Want to say thank you to the experts for answering all my questions over the past few years :) Bill and Rhiannon are here everytime tho, don't yall ever want to just be outside and not typing?? lol

Rhiannon: You are so welcome! Hopefully after this chat room I will be able to see some meteors for myself before catching some sleep! ☺

MicMelt: I live in deep south texas, what part of the sky should i look at ?

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Bill: Look up and avoid looking at the Moon.

Octiga: Is the comet Swift-Tuttle potentially dangerous to Earth?

Danielle: It has a stable orbit, it is no threat to Earth.

Bhive: Will we be able to see it in the Tampa Bay Area in Florida? Thanks for being so AWESOME:)

Danielle: Yes, if you've got clear, dark skies!! Thanks for being here!

bo90: Is this the best meteor shower for the year?

Rhiannon: Perseid rates are between 80-100 per hour if you have clear skies and very little moon light. The Geminid rate is slightly above that and the Quadrantids are right up there with them.

Escobar: Im in Nicaragua, will I be able to see it???

Bill: If you can see the stars of Perseus, you will be able to see Perseids.

ChiariPTCSongbird: We're in the Chicago suburbs and are trying to figure out where to look, do we have any chance of seeing anything from here?

Bill: If you can see stars, you can see Perseids. Look straight up and avoid looking at the Moon.

Bluesguy: does the comet stay in regular orbit ?

Danielle: Yes. It comes close to the Sun about every 133 years.

dank0822: Thank you so much for the live feed!!! We are using this opportunity to spend some great family time together!!!

Bill: You are welcome.

Vinoth: Unfortunately, it seems that I am in the city and it is cloudy. Thank you for taking the time to answer my question.

Rhiannon: We are sorry for your cloudy skies... hopefully you will be able to see some from our live-feed as we have very clear skies here!

Meteorfreak: if i live on valley stream long island, how clear will i see the meteor shower?

Bill: If you can see stars, you can see Perseids.

melisuh29: I have clear skys and havent seen any and its really dark where i lve. i havent seen any yet. What time would be the peek time to really see them

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Rhiannon: You should see more in the early morning. 3-4 am local time is your best bet. Good luck!

Thestarjamestrans: will it be visible in roanoke virginia?

Bill: If you can see stars, you can see Perseids.

Mbhagan: will I be able to see with the naked eye, or will I need a telescope?

Danielle: Yes!!! You definitely don't need a telescope to view Perseids. In fact, you shouldn't use a telescope. You want to see as much sky as possible -- so use your eyes. The more clear, dark sky you can see, the more likely you are to see Perseids.

Philly4x4: Will the meteors stand out from everything else in the live feed?

Rhiannon: Yes. It will be a streak of light.

LukeCC: Another question: Its past midnight here, went outside and let my eyes adjust in the dark. Can we see some of the Perseids right now? Or I should wait some more?

Bill: If it's past midnight, you should begin to see quite a few Perseids. The best rates are just before dawn.

snook215: will the Moon/Venus/Jupiter predawn view be dramatic?

Bill: It will certainly be pretty.

Alczar: It is very cloudy where I live and we are not able to view Perseid from my back yard. I'm watching the live feed now. I haven't noticed anything with in the past few minutes. Has there been any action? I'm just wondering if my pc is not clear enough to see it. Thanks!

Rhiannon: The rates will increase as the night goes on, peaking just before dawn. I haven't seen any in the live-feed yet either... though I'm mostly looking at the feed of questions. ☺

Brit: Here in England, the view is good- despite the cloud. The moon however is distracting- saw a few large ones and then of course, ones with smaller trains- it was beautiful.

Bill: Congrats!

Meteorfreak: will i be able to see?

Danielle: If you are in New York, you have a lot of light pollution to contend with. But if you can see stars, you can see Perseids. The amount of light pollution will make it so that you can see fewer meteors, however, than someone, say, out in the country.

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Scott_C_Palmer: Does the Swift-Tuttle's orbit extend past the Kuiper Belt or does it stay within our solar system?

Bill: Swift-Tuttle stays within our solar system and it extends out into the Kuiper Belt.

Tir-anna: Do you know how to find Polaris?

Bill: Look north. It's at the end of the handle of the Little Dipper.

Cam: Do these meteor showers potentially pose any danger to satellites and/or the ISS?

Rhiannon: Yes. There have been satellites affected by meteor hits, though it is not common. Our job at the Meteoroid Environment Office (MEO) is to let the ISS and satellite operators know the rates/speeds/fluxes of the meteors throughout the year. The ISS has shielding to protect it from meteors up to an inch wide.

Moderator Brooke: Hi everyone -- thanks for reporting on what you're seeing. MANY Perseids being observed over Earth tonight. Tell us what you see in your location! Our experts are working on your questions -- there's practically smoke coming off their keyboards. ☺

MattBabock: Will I be able to see it in Kansas?

Bill: If you can see stars, you can see Perseids. Look straight up and avoid looking at the Moon. After 10 p.m. local, regardless of time zone, and you will see the most meteors before dawn.

Sarkeny: It's a bummer to have cloudy skies here in Virginia, so grateful for NASA's Live Ustream and your willingness to answer all of our questions!

Danielle: Thanks for joining us! Sorry about the cloudy weather, I know that's frustrating.

Bolohuc: Why aren't you guys answering my questions?

Rhiannon: We have already received 307 questions in 25 minutes tonight. Trying to get to as many questions as possible. ☺

Rmsybkrgl: where and what is the zenith, i'm sorry i'm new at this

Bill: The zenith is the point straight overhead.

Mattelk: What time zone is the feed in?

Rhiannon: Central Time.

Zombabex: What is the zenith?

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Bill: The zenith is the point straight overhead.

Esra: comet swift-tuttle has 130 year period. How is it possible that earth passes through the debris of comet every year in the same month?

Bill: Because the debris fills the orbit of the comet and we run into this stuff at the point in which the comet's orbit intersects the plane of Earth's orbit.

Thestarjamestrans: just straight up for zenith?

Bill: Yes.

MattBabock: So anywhere in the united states can see them if the sky is clear?

Rhiannon: Yes. They can be seen at all locations except for Antarctic, southern part of Southern America, and southern part of Australia. If you can see the constellation Perseus, you can see Perseids.
☺

Starsearcher: is it true that the debris are over 1,000 years old?

Bill: Some of the Perseids are over a thousand years old, yes.

chicago_312: Would I be able to see it in Chicago, IL?

Danielle: If you can see stars, you can see Perseids. But because of the light pollution in Chicago, you won't be able to see as many as someone out in the country. (Shout out to Chicago! I grew up in the 'burbs.)

tjones102: Thanks Danielle!

Danielle: You are very welcome!

Thaddeus85: Here in nerfoundland one hr ago we seen a large one that lit up the sky :)

Rhiannon: Fantastic! Hoping to get some good ones here, too!

Jaf: what is best time to watch

Bill: After 10 p.m. local, regardless of time zone, and you will see the most meteors before dawn.

TriniDude071: what is the zenith?

Bill: The point straight overhead.

dank0822: how long will the showers last?

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Rhiannon: Perseids last until August 24th but their rates will significant decrease after tonight.

SpockvsData: I'm going outside now, just this small chat has inspired me a bit. Thank you guys so much for all your help on the questions you are what the human race needs more of... haha. Happy viewing everyone! :D

Moderator Brooke: To everyone viewing from South America, a message from our astronomers: if you live north of 32 degrees south latitude, you will be able to see Perseids.

mh5150: will any hit the ground?

Bill: Perseids burn up about fifty miles up.

PGC911: do we get a chance to see the swift comet from Earth? I remember the last comet and it was spectacular, but missing them

Rhiannon: Comet Swift-Tuttle is nowhere near Earth, so unfortunately we cannot view it.

Lunasage: Is comet swift-tuttle what makes the perseid meteor shower bright?

Bill: Swift-Tuttle produces the Perseids, but it is the size and speed of the meteors that make them so bright.

BmwBryan: About how many meteors are going to be visible per hour just before dawn?

Danielle: The Perseids consistently produce rates of 100 Perseids per hour under perfect conditions. Observers reporting to the International Meteor Organization (www.imo.net) have been seeing rates of 140/hr last I checked.

Hihi: will light pollution affect the show ?

Bill: If you can see stars you can see Perseids, but if there is a lot of light, it will certainly reduce the number of meteors you can see.

Erico: Could you see the meteor shower if you were on the moon?

Bill: No, because meteors are streaks of light caused by meteoroids burning up in the atmosphere. The Moon has no atmosphere and so there are no meteors.

thegang249: I haven't seen any yet on the live feed...am I missing them?

Danielle: Meteor observing takes a lot of patience... and coffee. Rates should increase as the night goes on.

Bejank: Will we still be able to see Perseids on Sunday night?

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Bill: Yes. The rate will be lower, but the show should still be good.

Jimmy: hi to all of you... i live in greece.. so here the sun come on again ... but i did it!!! i saw 13 perseids!!! very coool but i want to ask how this derbis come on earth!! ???

Bill: Congrats!

Nidrac: will the showers start soon im in crossville tennesse

Bill: After 10 p.m. local, regardless of time zone, and you will see the most meteors before dawn.

Vohpoh: Have we ever recorded any meteor impacts on the moon? Is the earth's gravity enough to distrub the Persied's stream of debris?

Danielle: Indeed! We have seen many lunar impact flashes -- caused by meteoroids impacting the lunar surface.

pantheress123: why havent i seen anything yet. its already 1120

Bill: If you are looking at your computer, your eyes are not dark-adapted and it will be hard to see meteors. Have patience and give your eyes time to adjust to the night --- you will see meteors. But remember the rates will be low until the early hours of morning.

Moonlight: What causes the Perseids shower?

Danielle: The Perseid meteor shower is caused when the Earth runs into a stream of debris left behind by the comet Swift-Tuttle.

Gary_Bauer: If there is just a thin layer of clouds, will the meteors drop though and still be visible ?

Bill: If you can see stars, you can see Perseids.

Kathy_-_Minnesota: Do you have an iPhone App to count the meteors?

Danielle: Yes, do a search on "Meteor Counter". You can also go to <http://meteorcounter.com>.

Moderator Brooke: A message from Bill, about viewing times and locations: "Regardless of your time zone, the Perseids should become visible about 10 p.m. local time, with rates increasing till dawn. Observers with clear dark skies can expect rates of one per minute or thereabouts. Standard meteor viewing applies. Lie on your back (blanket, sleeping bag, lawn chair) and look straight up. Don't use binoculars or telescopes -- they have too small a field of view -- and don't look towards the radiant in Perseus, as the meteors in the direction will have short trains and be less spectacular. Avoid looking at the waning crescent moon if possible."

Itadakimasu: It's 5:24 am here in Germany. Will I be able to see the Perseids?

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Bill: You don't have long before sunup. If the sky is bright, unlikely now, but you have another chance late tonight, early tomorrow morning.

jeff44663: Is there any possibility that any of the meteors could survive the entry through the atmosphere and reach the ground, or are they all too small?

Bill: Perseids burn up about fifty miles above your head. They cannot make it to the ground.

Carla: someone can see any meteorite?? im from argentinian

Bill: Argentina is too far south.

dumb1: What is Perseids?

Danielle: Perseids are a meteor shower caused when the Earth travels through debris left by comet Swift-Tuttle. The meteor shower is named after the constellation Perseus because the radiant, the point in the sky where the meteors appear to come from, is in Perseus.

dumb1: I'm in atlanta right now, will I see them around three am?

Bill: If you are away from city lights and can see stars.

MoxieGurl: If there is cloud coverage are the light streaks bright enough to flicker in the clouds ?

Danielle: We've seen Perseids through light cloud cover and through holes between clouds before. But you won't see Perseids through heavy clouds.

Bolohuc: Thank you so much for hosting this, I know you guys are so busy. This is my very first meteor shower and I would love to see some meteors. It is 11:20 PM here in Tennessee. Any recommendations for viewing?

Rhiannon: Fantastic! Glad you are interested. I would recommend getting as far away from city lights as possible and letting your eyes dark adjust for a while. You should see more meteors as the night goes on, peaking between 3-4 am local time. Hope you see many!

Maverick: What happens if I do not see stars do I see the Persieds?

Bill: If you can't see stars, you will not see Perseids.

Victoria_C.: How much will the moon interfere with the meteor showers this year?

Bill: It will be an annoyance, but should not affect rates too badly.

mh5150: will any hit the ground? great job ladies and gents

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Bill: No.

Michael: if i want to work at Nasa, but i'm young and i still study it is possible to konw what is required of me and what should i do and i study.

Danielle: A strong background in math and science would be a great place to start!

Brek: Is their any chance or risk that one day the Swift-Tuttle might collide with the Earth because if every year we get in the way of it Debris would'nt it make it a possibility?

Bill: The comet's orbit is far enough away from Earth that a collision is not likely for the next two thousand years, which is about as far as we can calculate things.

SpockvsDAta: What Do you guys do on a regular basis as a career? How would I go about getting the necessary education, and would you recoommend your field of study?

Rhiannon: We at the Meteoroid Environment Office have models to predict the risk to spacecraft from meteors. We observe meteors in several different ways to be continually improving these models and keeping situational awareness of the night sky with regard to meteors.

Lizzarruss: When does the meteor shower start? (If i missed it somewhere sorry)

Bill: After 10 p.m. local, regardless of time zone, and you will see the most meteors before dawn.

Moderator Brooke: Our chat room is rockin' right now, so please be patient as our experts answer your questions. A good crowd tonight, everyone is excited and on-topic. We appreciate that!

dumb1: Will any of the meteors land on earth?

Bill: No. Perseids burn up about fifty miles up.

Nidrac: been watching the feed and seen nothing any chance its started in tennessee??

Danielle: Sorry, I know it's frustrating. You'll see more and more as the night goes on.

chicago_312: What are meteors made of?

Bill: The Perseids are made up of bits of ice and dust from Come Swift-Tuttle.

Jo_Jo_Bear: If there was a meteor impact on the moon, would we be able to see it here on Earth?

Rhiannon: Yes! In fact we observe meteors hitting the moon! You can go to this link to learn more about this program: http://www.nasa.gov/offices/meo/environments/lunar_detail.html

Lunasage: How are meteors formed?

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Bill: They are bits of ice and dust ejected from comets as they move in their orbits about the Sun.

Munkeeeeeeee: are there such things as perseid fireballs?

Danielle: Yes! We often see Perseid fireballs (fireballs are just bright meteors). Check out <http://fireballs.ndc.nasa.gov> -- fireballs seen by the NASA All Sky Fireball Network are posted here.

Sblinde: When should we start seeing meteors on the stream?

Bill: We just saw one on the stream.

kelly511: Hi from Philly! I'm waiting til 12 to go out side and see if I can see anything with the clouds... where's the best direction to look?

Rhiannon: Lie on your back, let your eyes dark adjust and just look up!

Leslieperez: hey at what time do i go outside

Bill: The best rates are just before dawn.

Victoria_C.: Do these meteors hit the moon? If so, does it make a big impact?

Bill: Yes. They will leave a small crater, less than a meter across.

Sarkeny: If approx, 30 meteor showers occur annually, does that basically mean approx 30 comets have passed by earth in the last 100 years?

Rhiannon: Some of these meteor showers have been around far longer than 100 years. The Perseids were first observed about 2000 years ago as recorded in Chinese annals.

dumb1: How many meteors can we see around three am?

Bill: About one per minute, sixty per hour.

Erico: Could you see the meteors burning up in Earth's atmosphere if you were viewing the earth from the moon?

Bill: If you had a telescope, yes.

Austin: How big of a lunar impact is required to be seen from Earth?

Rhiannon: It depends on how fast the meteor is hitting the surface. It likely takes a meteor several centimeters across to make a flash bright enough to be detected on Earth.

Nidrac: im in tennessee any chance the show has started?

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Bill: The show has started, but rates are low. They will get better in the hours before dawn.

Victoriapizarro: can i see it if i live in south america?

Rhiannon: If you are north of 32 degrees south, you will be able to see Perseids. This is the latitude below which the constellation Perseus would not be able to be seen.

PGC911: is the camera online pointed to zenith?

Rhiannon: The camera is a low-light level video camera with a 25 degree field of view. It is pointing north, just above Polaris.

Lerah99: Is anyone seeing any meteors on the livestream vide from Huntsville?

Rhiannon: Yes! We have. And hopefully will see many more throughout the night.

Analannie: What are the odds a Meteor strikes somebody?

Rhiannon: There are no records of a meteor striking a person directly. So the odds are very low.

Dingle: when was the swift-tuttle orbit first determined and what methods were used to accomplish this?

Danielle: The comet Swift-Tuttle was first discovered by astronomers Lewis Swift and Horace Tuttle in 1862 with a telescope. Multiple subsequent observations allowed the orbit to be calculated.

TXMAN: I'm confused, some sites say to look to the northeast but this site says to look straight overhead. Which one is it?

Rhiannon: The radiant will be rising into the northeast but you should be looking straight overhead to see the meteors. You don't want to be looking directly at the radiant.

Nidrac: has any of the perseids hit earth??

Rhiannon: No. Perseids all burn up by 50 miles overhead. You won't get hit by one. ☺

Urooj: hi is the meteor shower going to be visible in mississauga canada? its really cloudy n bright here

Rhiannon: If your skies clear you should be able to see Perseids! Though if they stay cloudy there isn't much we can do for you. Hopefully the live-feed will show a number of meteors throughout the night.

DevanWeaver: Any tips as to what equipment to pick up as a beginning amateur astronomer? Sorry for being a bit off topic.

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Danielle: It really depends on what you want to do. You can start with binoculars or a small telescope. If you want to do astrophotography, you'll have to invest in a good camera.

MissChelle: I wont see anything if I dont peel my eyes away from this chat room! lol :) Headed outside with the hubby and a blanket! Good luck to everyone! Its a beautiful, comfortable night here in ky, hope that means we will get a good show!

Danielle: Too true! Thanks for joining us! Hope you have a great evening!!!

tjones102: We are in Kentucky and just now seen 3 go over, my wife saw one by the Big Dipper, would that one be the same as the Perseids?

Rhiannon: You can see Perseids all over the sky. I can't tell you for sure if the meteor you saw was a Perseid or not, but if it was travelling from the direction of the constellation Perseus, it likely was.

Lunalight: We had a great view on the perseids between 0 am - 4 am (european time) now the sun sets,it was a clear cold night

Danielle: Awesome! I saw a lot of Perseid observations from Europe being submitted to the International Meteor Organization (www.imo.net). Glad you had a great evening!

Lerah99: Are we ever able to see the Swift -Tuttle comet? Or are we just left with the debris?

Bill: We saw Swift-Tuttle back in the early 1990s and we should see it again in 2124.

melisuh29: Have any of the moderators seen any yet?

Danielle: Yes, we've seen a few on the live feed already!

MarkyMe: I know if the past they have been able to tell an approximate date or year that the stream we are passing through was left. Has this been figured out for this stream of debris?

Bill: This is not an outburst, but a normal shower and this material is the product of several passages of the comet around the Sun, not one specific passage.

willygirl1: what time does this meteors shower begin in connecticut

Bill: You should start seeing Perseids after 10 p.m. and the rates will get better until dawn. The best time is the early morning hours.

Docology: just had a fairly bright, maybe 3 seconds long fireball, was very neat

Danielle: Great!

Victoriapizarro: Is Chile too far south to see them?

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Bill: Yes.

JUANMILORUIZ: can i see meteorites? im from Colombia

Bill: If you are north of 32 degrees south latitude, you can see Perseids.

Navtej: How much CO2 they produce? Are they environment hazard? Can they contribute to global warming in any way?

Bill: They are not an environment hazard and they do not contribute to global warming.

Jimmy: tomorrow perseids will be visible in Greece??

Danielle: Yes, you'll be able to see Perseids tomorrow too

Victoria_C.: We can still see the meteors tomorrow night? Will that cut the amount of meteors I see?

Rhiannon: Yes. You will only see about half the number of Perseids tomorrow night. The Perseids will continue to be seen until August 24th.

Mmwysoc: At what altitude do most meteors disintegrate in the atmosphere?

Rhiannon: Perseids are all burned up by 50 miles up.

Newtonfigtree: When is the comet set to orbit the sun again?

Bill: It will next pass its closest point to the Sun in 2134.

olehippy13: I just saw one meteor in the south western sky, here in north Alabama

Bill: Congrats.

Condey: It will be possible to observe the Perseids in Portugal?

Bill: Yes, if the sky is clear.

Moderator Brooke: Thanks for your patience as we answer your questions. We have a FULL house tonight, and we're loving it. Our experts are working on answers for you. Looks like the whole world is watching the Perseids tonight!

Derekh: if I miss the perseids - due to cloud cover - what's the next meteor shower event to look forward to?

Bill: The next meteor shower event is the Orionids in October.

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Chrisptoronto: where is located the constellation Perseus, if you leave on the latitude of nyc or toronto? North? south?

Rhiannon: It will be rising from the northeast. However you do not want to look directly at the constellation Perseus. You will want to look directly ahead to see the most Perseids. Hope you see lots!

Caelan: Will the meteor shower be visible in Western New York on August 13th?

Bill: Yes, if the sky is clear.

ge2692que: is the app only for iphones?

Bill: There is an Android version available on the Android marketplace.

EvoLegend: what time on the east coast ?

Bill: You should start seeing Perseids after 10 p.m. and the rates will get better until dawn. The best time is the early morning hours.

Analannie: Could a eteor hit a space craft?

Danielle: Meteoroids can hit spacecraft, yes

Scott_C_Palmer: Do the comet fragments travel at a slow speed and the Earth just runs into them, or are they traveling at a high rate of speed into the Earth?

Bill: They are travelling at a high rate of speed relative to the Earth.

Leslieperez: will they be visable in southern texas?

Danielle: Yes, if you've got clear, dark skies

Apollo: Thanks so much for hosting this! I'm in Oregon, waiting for it to get dark enough to see the stars. I live on the outskirts of town, and there aren't any streetlights on my street. Is this far enough out to be able to see the Perseids?

Danielle: Thanks for joining us! Yes, you should be able to see Perseids if the weather is clear.

Ry: looking to experience meteor shower tonight with my fiance it is our 5 year and we live in wisconsin we had heard the ice debris would be crossing our orbit and would like to know in which direction to look, should we look between jupiter?

Rhiannon: Fantastic! You should lie on your back and look up. Let your eyes dark adjust and enjoy!

Dostal: any luck with the ustream live feed showing any of the perseids?

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Danielle: Yes, a few reports so far.

Hugo: There is any way to know when the Comet will run out of ice?

Bill: Most comets can survive several hundred passages around the Sun. We do not know when Swift-Tuttle will exhaust its volatiles.

Anderson: i am from egypt could i see it ?

Bill: You will be able to see Perseids tonight just before dawn.

Paul_A.: What is the average size of the particles that cause meteors?

Bill: 0.1 to 1 millimeter.

Hollynd: Do you know what music is playing on the video? It's wonderful.

Rhiannon: NASA's Third Rock Radio. Glad you are enjoying it!

PGC911: has NASA ever recovered any meteoerites in space for study? Crazy Question :-)

Bill: Stardust has gathered material from a comet and brought it back to Earth.

Noah: I am in Wisconsin, will this be peaking tonight? When should I go outside?

Bill: You should start seeing Perseids after 10 p.m. and the rates will get better until dawn. The best time is the early morning hours.

Maxdklein: how come perseids and other meteor showers return at the same time every year?

Rhiannon: We see meteor showers when we pass through the debris left by comets or asteroids. We pass through the same streams of debris every year which make these meteor showers annual. The Perseids are from comet Swift-Tuttle.

Rolltide: How large would a meteor have to be in order to penetrate the atmosphere and threaten people on the ground?

Bill: About the size of a football field, 100 meters or so.

Space_warf: When is the peek gonna be? Like around 4am or something?

Rhiannon: The peak will be around 3-4 am local time. Hope you see many!

Chrisptoronto: whrat is the COme Swift Tuttle made of? only ice and duts? iron? metal?

Bill: Comets are thought to be big dirty snowballs a few miles across.

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Austin: What's the entry speed of a typical Perseid?

Rhiannon: Perseids move at 132,000 miles per hour, or 59 km/s.

Mimi: can you see metors through the clouds?

Bill: No, you have to be able to see stars.

matt3990: Will the Perseid meteor shower be seen in the northeastern part of the sky?

Rhiannon: Possibly, though the best way to view them is to look straight ahead.

DigitalCrazy: Will I be able see it in the north of Londrina - Paraná, Brazil?

Bill: If you are north of latitude 32 degrees south.

Viper: Do doppler radars catch any images of meteor showers?

Danielle: Meteors are too high for doppler radars to detect them. Many of the Perseid fireballs our network has detected have completely ablated by a height of ~55 miles. However, in the case of deeply penetrating meteors, those that possibly make it to the ground, meteorite dust signatures have been seen in doppler radar.

Mary-Grace: I see the stars flickering on the stream, will I clearly be able to see it when a meteor passes?

Bill: Yes. The stars are twinkling due to the motion of gas in the atmosphere.

Radar51: Any possibility of damage to satellites? (sandblasting)

Bill: Very low and the biggest danger is that the Perseid would cause an electrical disturbance, not a hole.

lyle1966: How big is comet dust,ice debrie from this comet dust?

Rhiannon: The meteors you will see in the live-feed are only millimeters across. Though the streak of light is millions of times the size of the meteor. A meteor only 1 mm or so in size can create a streak of light the size of a battleship.

Gravityslave: Is there enough atmosphere on the moon to slow them down at all when they hit?

Bill: There is no atmosphere on the Moon, so they don't slow down.

McRaeman: hey from orlando, florida. just wondering whats the best time to go look and at which direction

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Bill: You should start seeing Perseids after 10 p.m. and the rates will get better until dawn. The best time is the early morning hours.

dewey316: thought it was the 12th and 13th

Danielle: The traditional peak is the morning of August 12. But you'll be able to see Perseids tomorrow too.

Canadian: I havent gone outside yet, but I assume us Canadians will have a great view? I am in Thunder Bay, Ontario, above Minnesota, off Lake Superior.

Rhiannon: Hello to a fellow Canadian! If you have clear skies you should have a great view tonight. Let your eyes dark adjust and look straight ahead. The peak should be at 3-4 am local time.

Phil: Where we should aim our sights to watch something?

Bill: Look straight overhead and avoid looking at the Moon.

A: At what point in its orbit is Swift-Tuttle? Where in the solar system is it?

Bill: It is out beyond the orbit of Saturn right now.

kalinka10: I am in MIAMI.....what time is for me?

Bill: You should start seeing Perseids after 10 p.m. and the rates will get better until dawn. The best time is the early morning hours.

Compusmurf: If the meteor could leave a meter size crater in the moon, what would it do the ISS?

Rhiannon: The ISS has protection build around it so that a meteor would have to be larger than 1 inch to penetrate it, and the chances of a meteor of that size hitting it is very rare. The surface area of the moon is much, much larger than that of the ISS so we will see more meteors hitting it .

Branwylde: Will I be able to see this shower from Texas?

Bill: If the sky is clear and you can see stars.

kelly511: Just got your answer to my first ques. thank you so much for doing this, I love everything about the stars! I now have an exclamation point where the Ustream video was playing thought... is there something I can do to get it back?

Bill: Try reloading the page in your browser.

Lerah99: Is the atmosphere on Mars dense enough to cause meteor showers there?

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Rhiannon: Yes. If you were on the surface of Mars you would see meteor showers there. Though they would be different meteor showers than seen on earth since Mars travels through different streams of debris. ☺

MarkyMe: great view on the cam and the meteors seem to be picking up. Thank you!

Bill: You are welcome.

jen406: will u be able to see in MI

Bill: If the sky is clear and you can see stars. Look straight up and avoid looking at the Moon. You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Mollymoe: Hi from Louisiana! (We'll be battling the mosquitos and humidity later on tonight as we venture out at 3am to see the spectacular show). Why do some meteors have tails and other don't?

Rhiannon: All meteors leave a streak of light, which is likely what you are seeing as the 'tail'. Depending on the size of the meteor you will see more or less of a tail. Hope you see many meteors tonight! ☺

Moderator Brooke: Thanks for your patience! We have a ton of questions that our experts are working right now. Please hang out with us and give them a chance to send you an answer. We're here til 3 a.m. Eastern, so grab some coffee and stay up with us to watch the Perseids.

Scott_C_Palmer: Why do some meteorites look red and others white when streaking accross the sky?

Rhiannon: Meteors can be orange, yellow, white, green, etc and may be due to the chemicals that are being released in the atmosphere, though mostly it is from the way our eye perceives them.

Grgrrhfr: Where is the live cam located right now?

Rhiannon: At Marshall Space Flight Center in Huntsville, Alabama!

Chrisptoronto: is the shower an hazard for long-distance airplanes at 10 km high?

Rhiannon: No. All Perseids will burn up by 50 miles ahead. No danger to airplanes!

Chrisptoronto: can these meteors hit and damage satelites? do satelites have a way to avoid them?

Danielle: Meteoroids can hit and damage satellites, yes. Some well known examples include satellite Mariner IV which was damaged by a meteoroid stream in 1967, and the communications satellite Olympus which was struck by a Perseid in 1993. The impact sent Olympus tumbling, its fuel was exhausted, and its mission was over. The threat from shower meteoroids is mitigated by reorienting sensitive equipment away from the radiant, slewing solar panels edge-on, closing shutters, etc. The

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threat from sporadic meteoroids, which represent a continuous risk to spacecraft all the time (as opposed to shower meteoroids which are quasi-periodic in nature), is mitigated by appropriate spacecraft design, e.g. meteoroid shielding.

Jsolomon: My family loves to watch this meteor shower. It's become an annual celebration and always marks the end of summer and beginning of school for us.

Rhiannon: Fantastic! What a fun tradition. ☺

Jan: what are they supposed to look like when you see them in person?

Rhiannon: Streaks of light. Commonly known as 'shooting stars'.

svelte18: Has it started? I'm watching the live feed now and cant seem to see anything but stars.

Bill: Yes, the rates will pick up as the night progresses.

Drcoktor: whats the visibility like in atlanta

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Chewbecca: how long is this meteor shower going to last?

Danielle: Tonight it will continue to be visible until sunrise. The Perseid rates will be best just before dawn.

Anderson: will any one hit the ground ?

Rhiannon: No. Perseids will burn up by 50 miles up. There are other meteors that have hit the ground and become meteorites, but Perseids have too icy of a composition to make it to the ground. Only the dense meteors survive the atmosphere.

Space: I'm in the Northeast US right now, it's a little cloudy but do you think there could still be any chance?

Bill: If you can see stars, you have a chance. You can also see Perseids tomorrow night, though they will be fewer.

tjones102: You all are doing a great job! Thanks for doing this, this is interesting!

Danielle: Thanks! And thanks for joining us!

allsew1: can u see them from the spacestation ?

Rhiannon: Yes! The astronauts on the space station can see meteors by looking down instead of up!

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Chewbecca: how long is this meteor shower going to last?

Bill: We should see Perseids on and off until the end of this coming week.

AYadiraa: Will i be able to see the meteors if i live in LA?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Niralsoni: what is that observatory from where is telecasted ??

Danielle: The livestream is fed from a meteor camera here at NASA Marshall Space Flight Center located in Huntsville, Alabama USA.

Cindy: What will be the best time to view the sky in Wisconsin?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours. If the sky is clear and you can see stars, you can see Perseids.

Munkeeeeeee: If one could touch the perseid how hot would it be?

Rhiannon: When Perseids are burning up in the atmosphere they are very hot (approximately 2000-6000 degrees Kelvin). Though one would not be able to touch a Perseid as they burn up by 50 miles up.

JOSEFO: DO YHE LIVE CAM POINTING TO ZENITH?

Bill: The live cam points north just above Polaris, the North Star.

Victoria_C.: Is this Third Rock Radio we are listening to?

Rhiannon: Yup!

Leahthelyon: This happens every year on my birthday and I've always missed it! Well, not this year!

Rhiannon: Fantastic! Happy Birthday!

Chrisptoronto: can we see if we look above more towards south than north?

Bill: Look straight overhead.

Vader: how fast are the meteors travelling?

Danielle: Perseid meteors are traveling 132,000 mph -- that's almost 100 times faster than a Concorde jet.

Abachner: which direction do i look?

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Danielle: Just look directly overhead, away from bright lights

matt3990: Will I be able to see the Perseid meteor shower if I face towards the northeastern part of the sky?

Bill: Look straight overhead. Meteors in the northeast will have short trains and not be very spectacular.

Mimi: Is it possible to see the metors through the clouds or no?

Danielle: Only through light cloud cover.

Gold_Dude: Have seen 2 fireballs and 3 other streaks. Still having to put up with Atlanta background light. Will go back out around 1:30 EDT. Might have to move to the back porch and liio more NW.

Bill: Congrats on seeing some.

J: Stars twinkle due to atmospheric blurring, yes?

Bill: Yes.

Atomic77: whats a radiant look like

Rhiannon: A radiant is the point in the sky from which the meteors appear to come from. The Perseids' radiant is in the constellation Perseus. That is how meteor showers are named - based on the constellation their radiant is in.

ADDO: I am in Colombia, south america, can i see the meteor shower?

Bill: If you are north of 32 degrees south.

Mantig: Anyone know if you can see the shower from fort knox kentucky?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Caitlin: Unfortunately, it's too cloudy in NJ to see anything. How often are there meteor showers?

Danielle: There are meteor showers all the time, though not ones with rates as high as the Perseids. The Perseids put on a good show every August. The next shower you might want to try observing is the Geminids in December -- the Geminids also produce high rates.

Woooo: Just saw a bright redish orange meteor does that mean it was a "fireball"?

Bill: If it was brighter than the planet Venus, you saw a fireball.

Nidrac: just saw my first dozen in under 5 min crossville tennesse inside city limits

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Bill: Congrats.

Gold1983: Why are they called meteors? I thought meteors were generally rocky in nature? Since they are icy bodies wouldn't they just be comet fragments?

Rhiannon: Meteors are a mixture of ice and dust. They are comet fragments (or asteroid fragments!).

Dskembrace: Where are Jupiter and Venus in this live feed?

Bill: The live feed only has a field of view of twenty-five degrees and is pointed north. Besides, Jupiter and Venus have not yet risen above the eastern horizon.

Savage: Since the earth is moving through the cloud of debris left by Swift-Tuttle, is there ever a chance that Swift-Tuttle will hit the earth sometime in the future?

Rhiannon: No. Swift-Tuttle will not hit the Earth. It is in a known orbit and we know it will not crash into Earth. 😊

Jill: What is Polaris?

Danielle: Polaris is a bright star in the constellation Ursa Minor, also known as the North Star or the Pole Star.

Furburger314: If, say, I was in Georgia and a friend was in Colorado, if we were looking at the same location in the sky, would we both see a meteor or does it differ by geography?

Bill: You can only see meteors within about a hundred miles of your location. So your friend in Colorado would see different meteors than you would.

Liberalinsc1: Is this the result of the Earth flying through the tail of a Comet ?

Danielle: It's the result of the Earth traveling through the debris shed by comet Swift-Tuttle many years ago.

jaccib81: can i see them from florida?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Chrisptoronto: on a regular night, how many meteors can we see? how many times more this number are we gonna be able to see tonight if sky is clear?

Rhiannon: On any given night you can see up to 8 meteors an hour. You will be able to see more closer to dawn. Tonight you should be able to see 80-100 Perseids an hour if your skies are dark and clear.

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Mimi_in_NYC: What is the smallest-sized meteor that could be visible from earth as it burns up in the atmosphere?

Bill: About 0.1 millimeter.

Meganisabellaakay: so i live in an apartment complex but our porch faces the sky and its real nice but theres some street lights around, will that make any difference in how i see the shower?

Bill: Yes. Get away from the street lights if you can.

Bhive: Few questions...Why should we avoid looking at the moon? We are going to go out at about 4:30am is that a good time and how active will it be? Also is there any other phone apps other than the Meteor Counter that pertains to this shower? Thanks Again:D

Rhiannon: You want your eyes to adjust to the dark so looking at anything bright is a bad idea. I would recommend going out between 3-4 am you may reach dawn very quickly going out at 4:30 am. Hope you see lot!! 😊

Rocketsledman: Could the Persieds generate fireballs or are they generally "too small"?

Danielle: Yes. Check out <http://fireballs.ndc.nasa.gov> where the NASA All Sky Fireball Network posts images and movies of fireballs, some of which are Perseids!

Theodora: Toronto is so cloudy right now! It makes me sad. Hopefully tomorrow night we can have a better view.

Rhiannon: We hope you have clear skies tomorrow night, too!

Emily: Hi, how many stars can be seen per minute?

Bill: If you mean meteors, you should see about 1 per minute just before dawn.

Starsearcher: is it about the size of a grain of salt? or can they be bigger?

Rhiannon: They can be bigger, though if you go outside tonight most will be the size of pebbles or smaller.

Lunasage: How big is comet Swift-Tuttle?

Bill: About sixteen miles in diameter.

Gravityslave: I just wanted to say thank you for doing this. Where I am, it's raining. And I don't drive, so this is my only chance to get out of the glare and see a meteor shower. It's an awesome experience, even remotely.

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Rhiannon: Fantastic! So glad you are enjoying it!

Greg: will most of these be traveling from north to south or south to north in the northern hemisphere?

Bill: North to south.

Bolohuc: Why is this supposed to be "the greatest meteor shower of the year"

Danielle: Because the Perseids consistently produce a good show with high meteor rates -- generally about 100 per hour under perfect conditions. The Geminids in December are also pretty good, but here in the US it's generally pretty cold at that time and people aren't as enthusiastic about going out to meteor watch!

Elevationkevin: Will the NASA Marshall Space Flight Center keep records of how many streaks are recorded on this live feed?

Bill: Yes, the meteor video is being saved to disk.

Carla: is corrientes argentina too far south to see them? latitud is 27 27

Bill: Argentina is too far south.

tuttle_swift: Cloud cover here in New York :(Thanks NASA for providing the cam!

Danielle: Sorry to hear that. Hopefully you'll catch some in the live feed!

Emily: can i see the meteors tomorrow night?

Bill: Yes, but the rates will be lower.

Maxdklein: Why do meteor showers occur at the same time every year?

Bill: Because the comet orbit comes near the Earth's orbit at one spot and the Earth passes that spot at the same time every year.

AnnomateDave: Sometime around 1994-1997 or so I witnessed a meteor shower from a remote spot in Minnesota. The shower was constant meteors across the sky, probably 100 a minute. Do you know what event this was and will it be repeated in the future?

Rhiannon: The Perseids in 1993 had rates of 300 per hour. It may have been that! The Leonids were also fantastic about a decade ago in the late 90's and early 2000's. Perhaps it was one of those! There will be meteor outbursts in the future and one of the jobs of the Meteoroid Environment Office is to predict when that will be!

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kae787: When would I see it in Chicago?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Neilyo: I'm in the UK and it's 5am now, Is it too late to spot them now? if not where should I be looking in the night sky?

Rhiannon: If it is not too light out then you can still see them! Only the sun rising up will stop you from seeing them if your skies are clear. ☺

Meganisabellaakay: will i be able to see any in austin, texas

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Shadowknightx: Will i be able to see the meteors if i am located in NW indiana?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Moderator Brooke: A message from our astronomers about viewing: "Regardless of your time zone, the Perseids should become visible about 10 p.m. local time, with rates increasing till dawn. Observers with clear dark skies can expect rates of one per minute or thereabouts. Standard meteor viewing applies. Lie on your back (blanket, sleeping bag, lawn chair) and look straight up. Don't use binoculars or telescopes -- they have too small a field of view -- and don't look towards the radiant in Perseus, as the meteors in the direction will have short trains and be less spectacular. Avoid looking at the waning crescent moon if possible."

llockert: So tonight is the best night for viewing? I was told tomorrow, I guess I need to wake my 6 y/o up in a few so she can see.

Bill: Just before dawn is the best time.

Chrisptoronto: are they also some flying stars tonite which are NOT from Come Swift tuttle?

Danielle: The Perseids aren't the only shower active tonight, but they are the most prolific. Other showers, including the Kappa Cygnids and the Alpha Capricornids, are also active right now. Their rates are much lower than the Perseids. They are also slower moving.

Erico: Where are you guys getting all of this awesome music? Thanks for the show from Canada! Already seen 4 meteors on your stream!

Bill: You are welcome.

Lfmc78: I saw a huge low down meteor in MI

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Bill: Congrats.

kalinka10: when is the next persaud meteor shower?????

Danielle: Next August!

40108Guy: I downloaded an app for my smartphone apparently made by NASA called "Meteor Counter"

Rhiannon: Fantastic! The Meteoroid Environment Office (MEO) put that app out along with Tony Philips with Science@NASA- glad you are enjoying it!

EDWIN: can be dangerous if one meteor strikes the earth ?

Bill: Meteors are too small to cause significant damage. Asteroids, miles across, can be dangerous.

Trminton: What area of the sky is the live feed pointed to?

Danielle: It is pointed north, above Polaris

Sun_Howler: What are the specs on the live feed camera?

Rhiannon: Just noise from the camera. Unfortunately that can't be avoided. We have seen several meteors in the live-feed and hope to see many more tonight!

Alexander_: It will see in El Salvador?

Bill: Yes. You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Audball: what is the name of the app for Android phones?

Danielle: Meteor Counter. It's available for Android and iPhone

Zgvariant: What makes the birghtest meteorite?

Bill: The brightest meteor is caused by a really big particle burning up.

JoMama: reckon wisconsin can see them

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn. Look straight up and avoid looking at the Moon.

Sarkeny: are the meteors fairly noticeable on the live Ustream to a novice meteor watcher? I haven't seen any, maybe it's just me :(

Danielle: Yes they are. The rates will pick up as the night goes on, too. Hang in there!

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Savage: Do these meteors affect our satellites?

Rhiannon: There is a risk to spacecraft from meteors. We at the Meteoroid Environment Office (MEO) have models to try to predict the risk to spacecraft from meteors. The ISS is often hit by meteors but it has armor and is very well-protected so there has never been severe damage from them.

Hansel_Mora: Good Evening! I'm from Colombia, Can I expect watching meteors?

Bill: If you're north of 32 degrees south latitude and the sky is clear.

Shannlen: hello from Nanaimo British Columbia Canada - saw a beauty this morning about 230am

Bill: Congrats.

Chrisptoronto: are meteors from all comets (and eventually all comets) made of the same compounds? where is this one coming from? how was it formed?

Bill: No.

Analannie: If the asteroid hits mars, could it start life there?

Rhiannon: Bacteria can't survive long periods of exposure to space so the chance is infinitesimally small.

Thomas: When will we start seeing them

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Cici: what time will it be visible in north dakota

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

StarGazer600: When will they begin to appear on the ustream below?

Bill: We have already seen a few.

40108Guy: is there a live feed of this shower from the ISS?

Bill: No.

Thaddeus85: When will the shower peak hit in Newfoundland?

Bill: Just before dawn.

Caelan: At what rate per hour will we see the meteors on Aug. 13th?

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Bill: The rate should be down to 40 per hour or so.

Jimmyscawk: What happens if a meteor hits earth.....

Danielle: Meteors hit the Earth's atmosphere and burn up completely all the time. Occasionally one will be large enough and slow enough to make it through the atmosphere and to the ground -- then it is called a meteorite.

Chrisptoronto: how can 1mm meteor be so bright and visible from so far?

Rhiannon: When the particle hits the atmosphere it starts to burn up and the ionization spreads out over a million times wider than the particle itself. That is what you are seeing. You can see them from so far away because of how high they burn up. Over 50 miles up!

Laura: Here it is 1 am, and I haven't seen any yet, is it because of the cities strong light?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Chrisptoronto: how fast does the meteor travels? what does give it such a speed?

Rhiannon: Meteors travel between 11 km/s and 72 km/s. Perseids travel at 59 km/s which is 132,000 miles per hour! FAST!

Cjman: will i be able to see them in norristown pa

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

john27cain: how big is Swift-Tuttle?

Danielle: It's 26-27 km (16-17 miles) across.

Turquoise: Hello Bill, Danielle and Rhiannon- just thought you'd like to know that I've watched Perseid since my son was about 6 yrs. old and he's 31 years old now. We would lay on our backs in our sleeping bags on our backyard deck at 2:30am on the peak night. I would play Music from the Hearts of Space cassette on a boombox. Then we would tell each other "There's one, there's one, there's one" until about 4:30am when it would slow. Our highest count was 24 in two hours. To this day, I still go out to watch and believe it or not, in downtown Chicago, you can be out on your deck and see many meteors, as long as you are above streetlight level, that simple! I saw a huge one about five years ago from a 7th floor deck around 8:30pm! Enjoy the viewing everyone! And thanks for the live feed! It's wonderful!!
Turquoise :)

Rhiannon: Fantastic! What a wonderful tradition!

kalinka10: i am in atlanta....what way do i look for this?

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Bill: Look straight overhead. Get away from city lights. If you can see stars, you can see Perseids.

Analannie: Does Swift-Tuttle have poison ice?

Bill: No.

JessLandes: Do the meteors completely disintegrate in the atmosphere or do particulates from them ever make it to the ground (and would we notice if it did)?

Bill: Perseids completely disintegrate. Meteors from the asteroid belt can make it to the ground.

Naudienc: Is the debris field stationary, or are these dust/ice chunks also moving?

Rhiannon: Great question. Not stationary. The particles have a velocity themselves, but when they hit Earth they have an additional velocity as Earth's gravity pulls it in.

De_Anna: As long as you can see the stars you can see the meteors?

Bill: Yes.

AnnomateDave: since ice is water is it possible for life to exist on a comet?

Bill: No, not as far as we know.

Benr: If it's an annual event, for how many years would we expect to continue to see this happen? Would our orbit move out of line from the debris first, before these passes "sweep" them up?

Bill: We can expect Perseids for many centuries to come. The Earth intercepts only a tiny fraction of the material ejected by the comet.

Sunk: just got back in from outside. It was freaking awesom! we some really bright ones.

Bill: Congrats!

Sunk: Does a bright shooting star mean is its bigger?

Rhiannon: Yes. The brighter meteors you see tonight correspond to the larger particles.

Mea12: At what time is jupiter visible

Bill: Jupiter rises about 1 a.m.

Neilyo: How much does each meteor roughly weigh?

Bill: About 0.001 grams.

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Hoagy62: Here's a question: About how long does it take from atmospheric contact to total destruction for these meteorites?

Rhiannon: Depends on how fast or how large the particle is. On average the Perseids we see start ablating at 66 miles up and are burned up by 50 miles up. So on the order of 15 miles.

Barjees: Any ideas on where to watch the stars if you live in a big city like L.A? Maybe malibu beach?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn. Look straight up and avoid looking at the Moon. Get away from lights as much as you can.

Victoria_C.: Just want to say thank you guys for answering all of these questions! I'm learning a lot!

Rhiannon: You are so welcome! Glad you are here.

Analannie: If Earth had no atmosphere, would it get hit?

Bill: Yes.

Revenant: Would you be killed if you got hit by one?

Bill: Yes.

Morgan: will the shower be visable in east tennessee? if so what is the best time to watch?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Thaddeus85: When is the best time to watch in Newfoundland?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

melisuh29: Will i see them tomorrow night around 4am?

Bill: Yes, but the rates will be less.

june_weckesser: My granddaughter is watching for the shower. Can someone explain what a meteor shower is? She is 8 years old.

Danielle: Very simply: When comets travel close to the Sun they heat up and eject dust/ice particles -- these are meteoroids. When the Earth travels through this debris, the meteoroids "burn up" in the atmosphere and we see it as light -- these are meteors. When the Earth travels through a dense stream of meteoroids, we see many meteors -- this is a meteor shower.

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bandeto01: Whne does the shower start for california

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Tstaley: I am sure you have already answered this question but is there a particular direction to look towards.

Bill: Lie on your back and look straight up and avoid looking at the Moon.

Mouseki: I've seen three or four on the stream, and it helps if you maximize the window :) Hi Again everyone (pretty sure this is the same group that hosted the Leonids earlier this year?)

Danielle: Great! Welcome back! Yes, we host several chats for meteor showers each year.

Linda: Hi I read somewhere that this meteor shower is the rarest, what makes this meteor shower so rare?

Rhiannon: This meteor shower happens every year, as each meteor shower does. There are no more or less rare meteor showers. The Perseids are one of the spectacular showing between 80 and 100 meteors on clear dark nights!

Rena: From Anacoco, Louisiana when is the best time and which direction should we look?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours. If the sky is clear and you can see stars, you can see Perseids. Lie on your back and look straight up. Avoid looking at the Moon.

Skypilot: Kokomo, IN here. I sat outside for a little over an hour and saw 5 or 6 really good ones. I'm on the edge of the city so the viewing isn't too great. One I think looked more like a fireball, another had a real long tale.

Rhiannon: Fantastic! So glad you have seen some.

b00mc1ap: Can you see Venus and Jupiter with your bare eye? What about with lights around?

Bill: Yes, they will appear as bright stars in the dawn sky.

Nickjonhatan: hi, i'm from Venezuela, Now it rain ¿believe the perseids cam be see within in four hours?

Bill: Yes, if the sky is clear.

Sblinde: How fast do meteors go into our atmosphere? How long does it take them to burn on average?

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Danielle: Perseid meteors travel at 132,000 miles per hour. That's about 885 times faster than the fastest steel roller coaster in the world, Formula Rossa, in Abu Dhabi! It takes on the order of seconds for meteors to ablate.

Emsy: Serious question here. Why do you think humans are so enthralled with space? I get the jitters through stuff like this and I don't know why.

Rhiannon: The vastness. The amount unknown. It is exciting! I feel lucky to get to work in this area!

Sgalaxies: How much of a meteor's color (as it appears to us) is influence of our atmosphere/rayleigh scattering?

Bill: Some of the color comes from the ionization of oxygen and other atmospheric constituents by the meteor as it ablates in the atmosphere.

Starsearcher: is it possible that they can began to show up a lot more past 3am?

Bill: Yes, they will be best just before dawn.

Barjees: How close to earth are these meteors? What are the chances of one hitting earth?

Bill: They are hitting us --- they are burning up in our atmosphere sixty miles over your head.

Ispeaks49: Just curious. I noticed that the stars in the live videos are not moving across the screen. I would think with the rotation of the earth the stars would move?

Danielle: They move very slowly across the screen.

Warren: and just lucked into getting a shot of a meteor heading for the 'pot' of the big dipper. i was thrilled and even moreso after not being able to see anything tonight! do you want me to send the pic in?

Bill: Sure!

Orange: What kind of technology do you use to predict these meteor showers?

Rhiannon: Fast, multi-processor computers. ☺ The models are fairly complicated with many inputs.

Liberalinsc1: Just saw a good one on the Cam ! This is fun ! I't Cloudy here in SC ! :-{

Danielle: Great!! Sorry it's cloudy, but I'm glad you can see them in the live feed.

Chrispaul: I hope to see one ...do you think is posible to see it from south america?

Bill: If you are north of 32 degrees south latitude and have clear skies.

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jt1720: how long did it take you to learn so much about meteors ? :)

Bill: Many years.

Salem: why don't they use an HD camera? it's so fuzzy! still enjoying it though!

Rhiannon: The camera is a low-light level video camera to see as many meteors as possible. Glad you are enjoying it!! Hoping to see many more meteors as the night goes on.

Mahui: what will be the best time to view the sky in Chile?

Bill: Chile is too far south.

Theodora: I live in downtown. Does that mean I have no hope? ;(

Bill: If you can see stars, you have a chance.

WVspe: can these showers cause damage to satellites?

Bill: Yes, but the odds of one striking a satellite are low.

Heavenleanna: Which direction in the sky are they coming from if we are watching the live feed?

Rhiannon: The meteors will appear all over the field of view, but the direction they will be going is right to left at this time though later on will be more upper-right to lower-left.

bdrake196: how long will this last,because its cloudy write now and i might get up later,so what time should i wake up

Bill: Just before dawn will have the best rates.

Steve_Stricklin: When I was young, my uncle and I found a solid nickel meteorite that weighed about three pounds. We had the University of Alabama Huntsville verify what it was. What is the most common makeup of a meteor?

Bill: Most are bits of ice and dust that completely burn up in the atmosphere.

Ytyt: Do meteor showers happen every year? If so, are there more than one shower each year?

Rhiannon: Yes! There are over 30 visual meteor showers a year. A meteor shower happens whenever the Earth passes through the debris left from a comet or asteroid. The Perseids, Geminids, and Quadrantids are some of the most popular.

Orange: if a meteor were to hit earth from this shower, how large would the crater be?

Bill: Perseids burn up sixty miles above our heads. They cannot make it to the ground.

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Leo: In the southern hemisphere do I have to look to north?

Bill: Look straight overhead and avoid looking at the moon.

Fleshstorm: is this video that we are watching live from somewhere or do we have to go outside and see it.

Rhiannon: Yes this video is live from Marshall Space Flight Center in Huntsville, Alabama! (Where we are located. 😊)

jsmyth75: What is the approx speed of the ones we see?

Rhiannon: The average speed of Perseids is 59 km/s or 132,000 miles per hour.

Mary-Grace: I am new to space watching, is Perseus the constellation viewed on the live stream now?

Bill: No, we are looking north just above Polaris, the North Star.

Lunasage: So the Perseid meteor shower is actually just from comet Swift-Tuttle and located in the Perseus constellation seen from here on Earth?

Danielle: The Perseid meteor shower is caused when the Earth travels through debris left behind by comet Swift-Tuttle. Meteor showers are named after their radiant -- or the point in the sky from which the meteors APPEAR to originate. The Perseids are named for the constellation Perseus. The Geminids are named for the constellation Gemini. The Lyrids are named for the constellation Lyre. And so on. 😊

Phil: Do the Perseids travel in the Earth's orbit around sun or they stay steady in the same position on space?

Bill: Perseids move in their own orbit around the Sun.

dank0822: We have already seen an amazing show, will it get better??

Bill: The rates will get better just before dawn.

Moderator Brooke: Hey everyone, just a note -- there are some clouds on our Ustream feed right now, so that's the haze you're seeing. It looks like a line of clouds coming in from the West, but they should clear soon.

Neilyo: How much does each meteor roughly weigh?

Bill: 0.001 grams.

dank0822: why is my chat not being seen on the feed?

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Danielle: We have hundreds of questions right now, so it's taking time for us to answer them!!! Please be patient!

MilaDear: In which direction will the meteoroids be falling?

Bill: You will see them appear anywhere in the sky.

Orange: if the earth was a different size, would the path or time frame of when these meteors occur be changed due to the increase/decrease in gravitation? thanks for doing this chat and live stream, I really appreciate it! :)

Rhiannon: Thank you for joining us! We are glad to do this. If the Earth was a different size the speed at which it hit the atmosphere would be different. Due to the Earth's gravity the minimum speed at which we detect meteors is 11 km/s.

Neilyo: How much does each meteor roughly weigh?

Bill: 0.001 grams.

Mikecz: Does the space station get affected by pebbles flying so fast?

Danielle: The space station is heavily shielded to protect against meteoroids and orbital debris.

Starwatcher: I am 2 1/2 hours south of Chicago and have seen a few!!

Bill: Congrats!

Phil: Does Perseids interacts with other planets or only with Earth? They have a steady position on the space in the Earths' orbit ant that's why we encounter with them each year at similar date?

Bill: Perseids orbit the Sun, just like any other body in the solar system. Imagine a "river" of particles continuously orbiting the Sun. When the Earth passes close to this river, we get the Perseid meteor shower.

Okas: Can I see the shower from in the middlewest in Brazil?

Bill: If you are north of 32 degrees south latitude and the sky is clear.

wis1234: what makes the rates per hour go up and down each year. shouldn't it go down as the comet ages?

Bill: The rates are variable depending on Earth's distance from the meteor stream.

Roy: what's the best angle to watch the meteors?

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Danielle: You want to lay back and look up, putting as much dark sky as possible in your field of view.

Sandy: looks like cloud cover here in southern MD too. is it worth it for me to stay up to catch some later?

Bill: Best rates just before dawn; you might take a peek then.

Bouchardfamily: Just came in from an hour or so of sky watching and was able to see about ten good ones (and we are in the city). Some were absolutely awesome. Clouds just rolled in in Windsor, Ontario so we're calling it a night. Thanks again!

Danielle: Thanks for joining us!!

Dianna_Schmidt: Will the Leonids produce a good show too? I may have the name wrong, They come around October.

Rhiannon: The Leonids are in November. The Draconids are in October, as well as the Orionids. The Leonids won't give as good of a show as the Perseids, though the Leonids became very well-known as they have had years in the past with huge rates. In fact the largest shower ever recorded was the 1966 Leonids with rates as high as 10,000 per hour. I wish I could have seen that!

Kyrisa: When will the Swift-Tuttle comet be returning to our solar system?

Bill: Swift-Tuttle is part of the solar system. It will next pass close to the Sun in 2124.

Sweet: When will we be able to see it Oklahoma city?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Mahalaallred: What will be the best viewing time of the Perseids Meteor Shower for middle Tennessee?

Danielle: Tonight in the hours before dawn, say between 3 and 5 am, if the weather stays clear.

Caleb93: Will this truly be the "best meteor shower" this year?

Bill: In terms of the number of bright meteors, yes.

Joseph_Gruber: Is that fog we are seeing on the live feed or noise?

Bill: Passing clouds.

Starwatcher: beautiful clear sky in Illinois!!!

Danielle: Shout out to Illinois, my home state!

Talkingchickenscratch: Is the meteor show every year at the same time?

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Bill: Yes, Perseids occur in mid-August of every year.

Icky: Is there any chance of the Earth getting hit by any of these meteors?

Rhiannon: The surface of the Earth gets hit by meteors (which are then called meteorites at that point) regularly. Most are not large enough to do significant damage. The chance of a Perseid hitting the surface of the Earth is infinitesimally small as Perseids have burned up by 50 miles up.

dank0822: How do I know the difference between a fireball and a meteor?

Bill: A fireball is a meteor brighter than the planet Venus.

Revenant111: How can a pebble burn so bright? And how does it survive I mean shouldn't it burn up instantly?

Bill: The pebble is hitting the atmosphere at about 130,000 miles per hour, which cause it to burn up completely, but because the atmosphere is very thin high up, it takes a couple of seconds to burn up.

Orange: when will the swift-tuttle make its next orbit around the sun?

Victoria_C.: Do you guys do live chats for other meteor showers?

Rhiannon: We have done chats for other showers in the past. Our next chat will likely be for the Geminids in December but keep your eye on <http://www.nasa.gov> to find out more details on that. ☺

yslin100: so if i can star, the chances are i will see something at 1-2am ?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Alfredo: I'm in Peru, I can see the Perseids?

Bill: If you are north of 32 degrees south latitude and the sky is clear.

Josh: Im trying to find times i will see it in indiana, anyone know the answer to that?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

robc3434: wowis this bill nye the science guy lol

Rhiannon: No. ☺ The Bill in this chat is Dr. Bill Cooke, the lead of NASA's Meteoroid Environment Office.

LaLa: How quickly are these meteors moving?

Rhiannon: Perseids are moving at 59 km/s or 132,000 MPH.

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Compusmurf: Do meteors make any kind of sound? Audible? Radio interference, etc?

Bill: Very bright fireballs can produce sounds. If the fireball gets low in the atmosphere, it can cause a sonic boom or produce an electrophonic sound which can be like hissing or sizzling or even popping.

BlanstonJR: Can the tails of meteors be seen by those on the ISS?

Bill: Yes.

Andrea_Michelle: I just want to know, where....countries, continents, is this going to be visible

Rhiannon: The Perseids are visible anywhere in the world except for Antarctic, the southern part of South America, and southern parts of Australia. If you can see the constellation Perseus you can see Perseids.

Rowan: I am so glad you have this available! It is cloudy where I live. My whole family stayed up to watch the show and now only I am awake. I will wake them when the show really picks up. Thanks again for the live feed!

Rhiannon: Fantastic! Glad you are enjoying it!

OcelotMatrix: Is there a peak time for the meteor shower?

Bill: Just before dawn.

Jim: what time do you mean by "before dawn"?

Bill: Between 3 and 5 a.m.

GinaD: A little bit off topic but how do you pronounce "Perseid"?

Bill: Per-see-id.

Clynners: extremely cloudy night here, so I can't see anything :(what's the chance of good viewing tomorrow night as well?

Bill: You can see Perseids tomorrow night, but the rates will be lower.

dank0822: What is a fireball?

Danielle: A fireball is a bright meteor -- one that is brighter than the planet Venus.

Mr_Brown: can the metors cause interfrance with the satelites and our communication devices

Bill: Only if they hit them, which is very, very rare.

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Rowan: Is that cloud cover or fog coming in on the camera? Or something else?

Bill: Passing clouds.

Godofdmg: Is it possible to see meteors at daylight?

Bill: Extremely rare. You can only see the brightest fireballs in the day.

Mr_Brown: Can data captured in a video be converted directly into a data set and loaded for analyzing

Rhiannon: Yes. We analyze the video you see in the feed with two different kinds of software that will tell us the speeds, directions, and other information about the meteors. We also observe meteors with all-sky cameras. You can see some of those meteors at fireballs.ndc.nasa.gov . Look back a couple days and you will see many Perseids.

Fleeting: Have seen a few in North Texas, about to get the kids and go outside town to avoid the lights. Should we wait until a little later for a better rate? It is 11:57pm here now.

Bill: The best rates will be just before dawn.

snowball5734: going to crank the hot tub up and enjoy the show

Rhiannon: Nice!

Ritac: Is it Lima Peru too far south too?

Bill: No, you should be able to see a few Perseids.

st0z: Has anyone seen the meteor from the live feed

Bill: Yes.

Yadaayada: Can meteor showers be viewed through a window?

Danielle: Yes. But the window may limit your field of view, meaning you'll see less meteors than if you went outside and looked at the full sky.

Kto: so if the earth is passing through the debris left from the comet swift does that mean eventually there could be a possible impact of rare collision??

Bill: Not with the comet.

Ritac: When is the next meteor shower? I would like to be camping on that date! :)

Danielle: The next shower with decent rates is the Geminids in December. Bundle up!

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icestorm0117: I'm trying to watch it from home but I cant even see the moon. why is that?

Rhiannon: Depending on where 'home' is, perhaps the moon has not risen. If you have clear and dark skies you should be able to see Perseids at an increasing rate until dawn.

Marie: I thought these meteors are supposed to look like falling stars? They just look like blinking stars lol

Bill: The objects that are blinking are stars. Meteors will be streaks.

Bplzizcool: I see the camera is in Huntsville. Is it by chance by the rocket center or the arsenal?

Rhiannon: On Redstone Arsenal at Marshall Space Flight Center.

robc3434: why is it that at dawn we get the best results?

Bill: Because the meteor shower radiant is highest in the sky then.

Yellowlion: This is very cool! Thank you so much Bill, Danielle, and Rhiannon for sharing your time and knowledge with us!

Rhiannon: You are so welcome! Thanks so much for joining us!

Moderator Brooke: Is everyone awake? I think you must be, from the number of questions we have in the queue. :) Our experts are working on them as we speak. Thanks for your patience, and thanks for sharing your Saturday with us. Again, some viewing tips: "Regardless of your time zone, the Perseids should become visible about 10 p.m. local time, with rates increasing till dawn. Observers with clear dark skies can expect rates of one per minute or thereabouts. Standard meteor viewing applies. Lie on your back (blanket, sleeping bag, lawn chair) and look straight up. Don't use binoculars or telescopes -- they have too small a field of view -- and don't look towards the radiant in Perseus, as the meteors in the direction will have short trains and be less spectacular. Avoid looking at the waning crescent moon if possible."

Matttttttttttttttttt: I keep seeing dim points of light move slowly and constantly across the sky, and they aren't blinking. Are these satellites?

Bill: Yes, those probably are satellites.

Ronny: Do the folks on the ISS see meteors below them being they are orbiting 240 miles above?

Danielle: Indeed they do! Astronauts on ISS photographed a meteor below them last August. And they imaged several Lyrid meteors from ISS back in April.

Duvignau: Are you recording this?

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Bill: Yes, if you are referring to the live feed.

RBullard: Good evening. We live just east of the Houston, TX area. Do to the light pollution from Houston, should look towards the east for a better viewing?

Rhiannon: No. Look directly ahead and let your eyes dark adjust. It can take a while. If you can see the stars in the little dipper that is a good sign. I hope you see lots!

duckfenderly1: Does a brighter streak mean it is burning up hotter or faster or is it just closer to the eye? also thank you for doing this chat for everyone!

Bill: A meteor's brightness depends on how fast it's moving, how big it is and how far from you it is.

Philly4x4: How much time do the meteors usually take to cross the screen?

Rhiannon: Fractions of a second. Though it may seem longer if your eyes do not respond that quickly.

bplu88: what will be the best time to see the stars from venezuela

Bill: If you are north of 32 degrees south latitude and the sky is clear.

Starwatcher: Do people in airplanes have good views?!

Bill: Airplane windows are not very good for observing meteors.

duckfenderly1: Does airlines radar pick up on any of these?

Bill: No, meteors are much too high to be picked up on airplane radars.

Revenant111: why is it called the perseid meteor shower?

Bill: Because the meteors seem to come from the constellation Perseus.

Marie: How heavily shielded is the space station? Give details

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

bplu88: what will be the best time to view the stars from venezuela

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Robin: Will all the meteors appear to be traveling in the same direction? Why, why not?

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Danielle: Shower meteors enter Earth's atmosphere along parallel paths. Perspective makes shower meteors appear to come from a single point in the sky (the radiant), just like parallel railroad tracks appear to diverge from a point on the horizon.

Brandonoh777: looks like your getting some cloud cover over the live cam :(the aviation forecast at least for HSV is clear skys there showing few clouds at 25,000 right now... hope they go away :)

Bill: Yes, we have passing clouds.

Roy: from some answers given before, it stated that the meteors are consist of dust or ice? Just feel confusing how come there are ice if they are moving around sun

Bill: Unless you get close to the Sun, it is very easy to have ice in space. Space is cold.

Meagan319: Does the current moon phase make viewing more or less difficult to view the shower? Does it matter? I remember last year, the moon was extremely bright, I think it was full, actually.

Rhiannon: Yes. Last year the moon was nearly full making rates closer to 20-40 per hour in ideal conditions instead of 80-100 as you have the possibility of seeing tonight. The low phase of the moon makes for much better observing this year. ☺

Mary-Grace: What made NASA choose the feed from this particular location?

Danielle: The Meteoroid Environment Office (MEO) is located at the NASA Marshall Space Flight Center in Huntsville, Alabama. The MEO's meteor camera is providing the feed.

Mimi_in_NYC: Seriously, you guys rock.

Bill: Thanks.

SabyBaby: if its partly clouded can i still see it?

Rhiannon: If you can see stars, you have the possibility of seeing meteors. Hope you see lots!

Dathina: is that clouds in the live feed now?

Danielle: Yes we have clouds drifting through the video feed now.

PrimordialAstronaut: How long will the shower be visible? It's pretty cloudy here tonight (Reporting in from South Carolina)

Bill: You will be able to see Perseids tomorrow night, but the rates will be lower.

jen406: me and my 6 yr old son are very disappointed here in MI too many clouds but he wants me to ask you if a dog has even been on the moon with an astronaut

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Rhiannon: Unfortunately no. No dogs on the moon yet. ☺

Kto: what are some other showers we can see later this year?

Bill: Orionids in October and the Geminids in December.

SkyGazer: was lucky enough to have had the power go out and sky clear up for a few minutes and was able to see a few as well. Such an amazing sight. And thank you for having this chat available :)

Bill: You are welcome.

seli532: will i be able to see it here in GA?

Danielle: Yes if the weather is clear and the sky is dark.

Jimbotter: Is Rhiannon named after the Stevie Nicks / Fleetwood Mac song? I love that song!

Bill: She has Irish roots.

phobia42: I was disconnected, and don't know if my question is still in the queue, but will the shower still be going on Sunday night (into Monday morning), or will I have missed it?

Rhiannon: Yes. Though rates will be much less. Tonight you should see between 80-100 per hour in ideal clear and dark skies. Tomorrow night you will be lucky to see half that number.

Rjpettit: Fantastic viewing in the north suburbs of Chicago since 10p, even with the light pollution! Why do the most brilliant streaks appear to leave a "smoke trail"? All of us (including my 10 year old) remarked on the same thing. Is this a common optical illusion?

Bill: Bright meteors can leave a train that looks like a smoke trail. It's not an optical illusion.

Austin: When is the best time to see the line up of Venus, Jupiter, the crescent moon tonight?

Bill: Just before dawn.

XCalibre97: Can you view this in Northern Alberta and what direction would you look?

Rhiannon: Yes! You can begin to see them after 10 pm local time and rates will increase until dawn. Lie on your back and look straight up. Give your eyes some time to dark-adjust and enjoy! ☺

Peeka: We are in Oregon.. should we go up into the hills to see anything? Right now we live on street level.

Bill: If you don't have many street lights, you can stay where you are.

Kellythedog: when does a meteor become a meteorite?, when it is less than 50 miles high?

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Rhiannon: When the particle is in space, it is called a 'meteoroid', when it is burning up in the atmosphere it is a 'meteor' and when it lands on the ground it is a 'meteorite'.

Christy: When will they possibly be visible in Southeast Georgia?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Lanstine: Do they ever slowly burn through sky or do they always streak across

Danielle: Perseids move very fast, 132000 mph, so they streak across the field of view quickly.

XCalibre97: What direction to you normally look at the night sky to view the meteor shower?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Jacob: I just saw a really bright one that looked like it was right overhead. Wicked awesome! Do other people in nearby time zones see the same thing, or would it look to be off in the distance to them?

Rhiannon: Fantastic! The same meteor can be seen by people up to 200 miles away.

Patoz: Completely overcast in Pensacola, FL. Can't see anything. :(How is the camera oriented? Is the top of the screen North, South or what, and which direction are they coming from and going to? Also, I'm assuming the background music is prerecorded from Third Rock without the station ID, because the stream is different. Is that correct? Sorry for all of the questions...

Bill: The camera is pointed north, just above Polaris. And, yes, the music is from Third Rock.

Matthew: Where do i need to look from the belt of Orion to get the best chance of viewing meteors?

Bill: Look straight overhead; ignore the belt of Orion.

alejandra_loaeza_: Hello, is it possible that in Mexico City could we see the meteor rain???

Bill: Yes, if the sky is clear.

Birthdaygirl: how long does it take to answer questions? Just wondering how long I should wait for my answer? No rush, just curious :)

Rhiannon: We have received nearly 2500 questions in 2.5 hours so we are trying to get to as many as possible and answer a variety of different questions. ☺

MissChelle: Saw a few meteors tonight but sadly, I have to get some sleep before work tomorrow! I was just curious, however-- while we were watching the skies tonight, we noticed a strip of hazy looking

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sky among the stars that we thought were thin clouds but it never moved, if that makes any sense I was wondering what that is? Not exactly a meteor question, Im know, sorry lol

Danielle: That may be the Milky Way ☺

Jacob: From outside, when I see a meteor that's off in the distance on the side of my field of view, is it directly overhead for someone somewhere else?

Rhiannon: Yup! That is correct.

kjell Kjell: When was the best year for the Perseids? The best I remember was back in the late '80s or early '90s when it looked like someone was striking a match a few feet from me. There were about 40 of these bright events per hour.

Jsolomon: So disappointed in the panhandle of Texas. We have LOTS of cloud coverage.

Danielle: So sorry to hear that. ☹

Bauer: is it necessary to aim for 100 miles away from large light sources or is there a more practical mediatory length to aim for?

Bill: If you can see the stars in the Big Dipper, your sky is good enough.

Birthdaygirl: Where can I get detailed information on the shower?

Bill: Go to <http://www.imo.net> and choose the 2012 meteor calendar. Or use Wikipedia.

duckfenderly1: have you see two perseids hit each other while burning up?

Rhiannon: No. The chances of that happening are very, very slim as these particles are cm to mm sized (pebbles) and the atmosphere is very large. Lots of room for them all to burn up in their own space. ☺

XCalibre97: What direction do you generally look in the night sky?

Danielle: Look overhead, putting as much of the dark night sky in your field of view as possible.

Brandonoh777: what causes the differing rates in the shower? We are traveling through the most dense part of the tail tonight?

Rhiannon: Yes. That is correct. Tomorrow night the rates will be less as the part of the stream we will be going through is less dense.

Compusmurf: Are you performing any radar based count or is the area too vast for any realistic counting using earth based sensors?

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Bill: There are radars measuring the ionization trails of meteors as they enter the atmosphere.

Armiewife: It is Just after 10pm here at Joint Base Lewis McChord Washington and we have already begun to see a few Perseids. Brewing some coffee so we can stay up and see more and hope to get some good pictures. :)

Bill: Congrats!

Ujslost: where do I look? North South???? Towards the moon?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

XCalibre97: What direction is the constellation Perseus in the sky?

Bill: Northeast.

jerry-Balt.MD: How many satelites have been damaged by meteor showers in the past?

Rhiannon: Many satellites have been hit by meteors and most often it does minor damage (i.e. control loss for a short time), though in 1993 a Perseid hit the satellite Olympus and ended its operational lifetime.

Naudience: Are satellite/orbiter flight paths altered to avoid the major debris fields?

Bill: No. The odds of a collision are small enough that it is riskier to change the satellite's orbit.

Max: how about montreal and moscow , can my friends see the shower and whot time?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Pegahlak: what is a temperature of a meteor , do they have different temperatures?

Rhiannon: A meteor is about 2000 to 6000 kelvin!

WRain: How many miles above earth are our satelites? You said the meteors burn up about 60 miles above?

Bill: Satellites orbit at distances greater than 200 miles above the Earth. Perseids burn up sixty miles above the Earth.

Future_Astronome: IF you see a big fireball sized meteor can you expect that it will hit the earths surface?

Danielle: No. We see fireballs quite frequently and they burn up entirely in the atmosphere. A fireball is just a bright meteor, brighter than the planet Venus.

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angel82st0204: if i am in texas from witch direction will the meoters be passing?

Bill: You will see them all over the sky.

Matthew: Will the meteors appear bigger during predawn?

Bill: No, you will see more of them.

Carlyehannah: If I'm in Florence, Alabama, what will be the best time to view the shower?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

TheCampyMom: We noticed that the meteors seem to be coming from different directions. Why is that?

Rhiannon: All Perseids will appear to come from the constellation Perseus, though they will be all over the sky. You will also see background (sporadic) meteors as well, which come from all directions.

Mark: I live fairly close to a large city. can i still see the Perseids? Where should i look?

Danielle: If you can see stars you can see Perseids. But the light pollution will mean that you see less meteors than someone with a very dark sky.

Bauer: You are responding to much less worthy questions than mine :-(haha what annual meteor shower's mineral compositions/frquency provide the best show in your opinion?

Bill: In my opinion, the best meteor shower is the Geminids, because it has the highest rates and the meteors come from an asteroid, not a comet.

JamieS: just saw one hit the sky here in Olympia Wa

Bill: Congrats.

GLPMoran: Could a meteor penetrate a space suit?

Bill: Yes. A one millimeter meteor can penetrate a space suit.

Future_Astronomer: Are the meteors actually moving or is it the Earth? Or are both moving?

Rhiannon: Both are moving. We see more meteors in the direction of earth's motion. Think of a car driving on a highway - more bugs will splat on the front of the car. However if the bug is going fast enough it can splat on the back of the car as well.

Amol: If earth is passing through the debris of dust and ice then how come it doesn't fall on the earth?

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Danielle: The debris burns up/ablates in the Earth's atmosphere before ever reaching the Earth.

The_Baower: will you be able to see this meteor shower every year?

Bill: Yes, in mid-August.

p3ns317: Are shooting stars that travel in the opposite direction of the radiant just regular ones not associated with the meteor shower? I have seen two tonight from my location already.

Bill: Yes, shooting stars that did not come from the radiant are either part of the sporadic background or members of another meteor shower.

Astrobrit: Any chance of catching some action in the skies above southern Ireland?

Rhiannon: Absolutely! If your skies are dark and clear you should be able to see meteors tonight. Hope you see lots!

MicMelt: Could the debris left from the comet get through our atmosphere and cause damage?

Danielle: Cometary debris is very fragile and moves quite fast. It ablates in the atmosphere.

Brandonoh777: In reference to airplanes i am a commercial freight pilot so i fly alot at night i have seen them from the cockpit many times!!! if its nice and dark

Rhiannon: Fantastic! That would be a great view!

Elizabeth: how come it takes so long for swift tuttle to orbit the sun?

Bill: Because its orbit is highly elongated extended out beyond Neptune's orbit.

Drea: Hello from NYC! just went up to the roof of my building and unfortunately it's very cloudy, BUT with patience I got to see very dimly two meteors go by! Very exciting for living in a city that never sleeps! Also thank you guys for answering all our questions! =]

Bill: You are welcome!

Mickie: Is it possible to get a copy of the questions and answers...I'm learning soooo much!

Danielle: I believe a chat transcript will be linked from the chat page later this week.

KellyBear: What will be the best time for Huntsville to see it all?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

Cha: Thank you NASA for the live feed, San Diego become too cloudy. =(

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Danielle: You are welcome! Sorry about the clouds. ☹

Matthew: Do you have to be looking at the constellation persius to view the meteors or will they appear all across the sky?

Bill: Do not look at Perseus; look straight overhead. They will appear all over the sky.

ArtistJen: Seeing quite a few here in Norman, OK. Saw some really good ones last night!

Bill: Congrats!

Rafa: it is possible that we can be hitted by a perseids

Danielle: No. Perseids burn up in the atmosphere.

DISH: i don't see any star in the sky tonight. any chances of spotting the perseid shower?

Bill: No, if the sky is cloudy, you will not see any meteors.

David_100: will I able to see anything from suburban area?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Caterpillar: Where is the Swift-Tuttle comet in relation to Earth now?

Bill: Swift-Tuttle is currently beyond the orbit of Saturn.

Karkat_Vantas: What time would be very best to view it from Georgia~?

Bill: You should start seeing Perseids after 10 p.m. local time, regardless of your time zone, and the rates will get better until dawn. The best time is the early morning hours.

skywatcher12: if you are in north ga .. which way would be best to see the meteors? looking to the northeast for casiopeis to try to find perseus

Bill: Lie on your back and look straight up. Avoid looking at the Moon. Do not look at the radiant. They will appear all over the sky.

Neo: What size are these?

Bill: 0.1 to 1 millimeter.

Fleeting: Is ZHR max the number of meteors a viewer is likely to see an hour during the peak or an average over the course of the shower?

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Rhiannon: ZHR is the number of meteors an observer will see under clear dark skies if the radiant were at the zenith. This is reported to the International Meteor Organization (imo.net) and they provided really great real-time graphs of how many meteors are being seen during the peak of various showers.

Matthew: Do you guys keep track of the hourly meteor rates?

Danielle: We don't keep track of them live from the video feed, no. The International Meteor Organization receives meteor observation reports and posts rates live, but they are often revised later as more observations come in and more analysis is done.

Mithra: the experience is better if I have a telescope?

Danielle: No, a telescope will reduce your field of view. You want the biggest field of view possible -- so your eyes are best!

kjell Kjell: Exactly where in the eastern sky should I be looking? I can see Cassiopea and Cygnus and some bright stars below them. Should I be looking straight up or more to the east?

Rhiannon: Do not look towards the eastern sky... just look up. Find a place to lie on your back and let your eyes dark adjust. Hope you see many meteors!

Saskia: Does the light coming from large cities and sports fields affect the ability to see stars and Perseids?

Danielle: Yes it does.

Brandonoh777: how long has this perseids shower been going on? before human history?

Rhiannon: The Perseids have been observed for about 2000 years, with the earliest records on this meteor shower found in Chinese annals in 36 AD, and then consistently recorded in the 8th, 9th, 10th and 11th centuries. However credit for the shower's annual appearance is given to Adolphe Quetelet who reported in 1835 that there was a shower emanating from the constellation Perseus. There is lots of interesting history surrounding the Perseids, I'd encourage you to read more! ☺

Jbctdc: is the constellation near the big dipper?

Danielle: The constellation Perseus is near the constellations Cassiopeia and Taurus. But you don't need to stare at Perseus to view Perseids.

Fleeting: Do we know an estimate of the number of debris that makes of Perseids? Is new debris constantly breaking off Swift-Tuttle and adding to Perseids or is it rare and the debris we see pretty old?

Rhiannon: The debris we see is likely pretty old, though when Swift-Tuttle comes closer to the Sun it will leave new debris.

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Mary-Grace: I remember seeing a great meteor shower in November of what I think was 2001. Does that sound right and what was it?

Rhiannon: Yup! That would be the Leonids. They made the news as that was one of the most spectacular meteor showers of the last several decades. Glad you saw it!

QueenPixi: How can something so small entering our sky burn so brightly?

Danielle: They're moving incredibly fast!!! Perseids move at average speeds of 132,000 mph. A Perseid could travel from New York City to Los Angeles in just over a minute!

Michael: My neighbor said that there will be no moon during the Geminids in December and it should be the best show of the year with magnitudes averaging around 2.5. Is this true, what is the highest measure of magnitudes, and in which direction should we be looking.

Bill: Perseids are generally brighter than Geminids so what constitutes the best show is a matter of opinion. The Geminids have higher rates, but are usually fainter on average. You should look straight overhead and take in as much sky as possible.

Stratowx: do you have an estimate for how long this comet debris trail will last such that Earth will have annual showings?

Bill: Many centuries.

Felix: When will be the best viewing time for the shower tonight?

Bill: The best time is the early morning hours.

Future_Astronomer: Not sure if my question was answered yet but: I went outside tonight and took picture and caught one of a meteor and there was a red yellow and green looking trail behind it. What is this caused by?

Rhiannon: When different elements in meteors are ionized, they produce colors. For example, green is ionized oxygen. Glad you got a picture of a meteor!

Victor: all's meteor's have a similar temperature?

Bill: Depends on how fast they move; faster meteors are hotter.

llockert: I can see them quite well being 35 miles away from Birmingham

Rhiannon: Great! I hope to go outside after the chat and see some for myself, too. ☺

jbates88: when will this go down

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Danielle: The Perseid shower is going on now. Rates will increase throughout the night and be the highest near dawn.

Meagan319: Has there ever been a meteor shower where there is a rate of over 120 meteors/hr? Or have there been meteor showers recorded where the meteors fall constantly and more densely in the sky? Or is that just done in movies?

Bill: Meteor showers have been recorded with rates of many thousands per hour. For example, the Leonids of 1966, the Draconids of 1945, the Andromedids of the latter 1800s and so on.

Jemmalee: is this shower different because jupiter and venus and the moon align

Rhiannon: The planets you see tonight have no effect on the meteor shower. They just increase the spectacular views you can see tonight in the night sky!

overthehill1: In what direction should I be looking in Northern Illinois

Bill: Straight overhead.

The_Baower: Are the perseids visible every year?

Danielle: Yes. They are generally very consistent year-to-year.

fowlerTX: Since you can get the best view from the constellation Perseus, what is the easiest way to find said constellation?

Rhiannon: Perseids emanate from the constellation Perseus, but they are seen all over the sky. To see the most meteors just lie on your back and look up. Let your eyes dark adjust and enjoy! Hope you see many!

AbsolutSpaceGuy: I saw two meteor at the same time shoot off in different directions an hour ago... how fast do they travel?

Bill: Perseids move at 130,000 miles per hour.

Steph: Jacksonville cleared up some...seeing lots of them. had a gorgeous one that left a trail. Older kids are out with me learning a lot

Bill: Congrats.

Felix: If I live in Washington state what would be the best viewing time?

Bill: The best time is the early morning hours.

Shetep: Does looking straight up work best wherever you are located?

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Danielle: Yes, that is generally best from the northern hemisphere.

Moderator Brooke: How is everyone doing? We're getting a lot of reports that the Perseid rates are picking up now that we're in the midnight-to-dawn window. Our experts are still working on a lot of questions, and they appreciate your patience. A lot of new people are in the chat now, so here are those viewing tips again: "Regardless of your time zone, the Perseids should become visible about 10 p.m. local time, with rates increasing till dawn. (Peak viewing between 3-5 a.m. your local time.) Observers with clear dark skies can expect rates of one per minute or thereabouts. Standard meteor viewing applies. Lie on your back (blanket, sleeping bag, lawn chair) and look straight up. Don't use binoculars or telescopes -- they have too small a field of view -- and don't look towards the radiant in Perseus, as the meteors in the direction will have short trains and be less spectacular. Avoid looking at the waning crescent moon if possible."

Fleeting: Bill: You said Geminids is the best meteor shower because the meteors come from an asteroid and not a comet. What is the difference?

Rhiannon: Geminids are more dense than Perseids as Perseids have more icy composition. Geminids are not the best meteor shower because they come from an asteroid, they are the best because they show the highest rates. Density would be the main different between a meteoroid that came from an asteroid vs a comet.

fowlerTX: what is the best direction to be facing?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Yei: ok somebody tellme what time i can see in toronto

Bill: The best time is the early morning hours.

73crule: Great viewing at 8,000ft here in Gunnison CO . Good space watching music to, what ch.

Rhiannon: Glad you are enjoying it! This is NASA's Third Rock Radio.

Mark: Will the light polution of nearby Chicago interfere with my viewing of the shower?

Danielle: It will reduce the number of meteors you can see, yes.

Chris: Just spent an hour in the backyard and saw about 12 distinct meteors! Thank you so much for all of the advice! When will the next noticable shower be?

Bill: Congrats. And Orionids are the next meteor shower.

Felix: Whats is the difference between a star and a sun?

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Rhiannon: The sun is a star. The sun just has a special name as it is the star in our solar system.

James_Beauchamp: Greetings all.

Rhiannon: Greetings! Thanks for joining us.

cwhite47: Saw 35 in about an hour here in KY

Danielle: That's excellent!!

Shetep: Is there an approximate guess on the number of years it will take for the comet debris to completely burn up/go off track where we won't be able to see a Perseid meteor shower?

Bill: The Earth intercepts only a tiny fraction of the debris left by Swift-Tuttle. The Perseids will be around for many centuries.

Etaoin: How much light pollution is enough to obstruct view of the Perseids? Trying to determine how far out of my rural city I need to drive.

Rhiannon: It is best if you can get to a place in which you can see all the stars in the little dipper. If you can see any stars, however, you have the chance of seeing Perseids. Hope you see lots! ☺

jtc3: can we see the comet they are coming off of ?

Bill: Not right now --- it is currently beyond the orbit of Saturn.

Matthew: I have noticed over the past 30 min.-1 hour that some meteors have streaks and some don't, why is that?

Bill: In general, the farther a meteor is from the radiant (Perseus), the longer the trail.

p3ns317: I saw one that possible came from the direction of the waning delta aquarids that appeared to break up into a few pieces right at the end of its streak. Am I seeing things or is that possible?

Rhiannon: Absolutely! The Southern Delta Aquarids are still active and we have seen many lately as well. Check out fireballs.ndc.nasa.gov and go back a few days to see various active meteor showers.

potus98: Most of the meteors appear white, but one seemed red with white, another one blue. Are my eyes tricking me, or is this possible? Is the color due to composition of what's burning or direction of the meteor (red shift)?

Bill: The color of a meteor is due to many factors, but not red shift. You are seeing colors caused by the ionization of molecules like oxygen. Also, our eyes have difficulty distinguishing colors at night. Remember the old expression "all cats look gray at night."

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Shetep: Approx. how much of the night sky (on average) will one meteor cover from the moment it ignites to the moment it burns up ?

Rhiannon: On average we start detecting Perseids at 66 miles up and are all burned up by 50 miles up. So on the order of 15 miles.

Globex: How bright are the meteors actually? If I were sixty miles above staring one face to face, would my vision be compromised? And how is it possible that we can see one from so far away when they are only pebble size?

Bill: Yes, it would be compromised. You can see them from far away, because (a) Perseids generate a lot of light when they hit the atmosphere at 130,000 miles per hour and (b) they are very high up, so people on the ground can see them a fair distance away.

Delphiki: do you think I would be able to see the perseid shower from bakersfield, ca?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Season: How about in Orange County, Cal?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Dunrobin: Hollywood sci-fi makes meteor fields out to be disasterous obstacle courses. Are they really so dangerous?

Bill: No, Hollywood greatly exaggerates the risk.

khammond00: I remember a meteor shower about 10 years ago that was so active and it seemed like they were so large and so close to the earth.

Danielle: That may have been the Leonids -- they were very active about a decade ago.

OhhMrDoo: Is now a good viewing time? Its 2 A.M.

Bill: Its best between 3 and 5 a.m., but you should see some Perseids.

Jimbotter: At what time will the Perseids radiant appear at the zenith? I'm guessing that the radiant approaches the zenith after sunrise, which is why just before dawn is the best time to view them. (Am I right?) But does this vary from year to year? (also, Rhiannon: Go Irish!)

Rhiannon: We pass through the more dense part of the stream between 12:00 and 14:00 UTC which is during daylight on Sunday morning for us in America. Also the radiant is still rising during dawn. It is a combination of those two things that cause the highest rates to occur before dawn. ☺

Chris: When is the next noticable meteor shower after this one?

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Bill: Orionids in October.

anthonybr76: so would now be a good time to watch

Bill: Depends on what your time is. Between 3 and 5 a.m. is best.

Mike: why do they all seem to derive from perseus? do you maybe have a link to a geometric explanation?

Danielle: The meteors associated with a particular shower have similar orbits, and that's why they all appear to come from the same place in the sky

Katyintx: I'm watching on the NASA live feed as we are too cloudy here. Should I be seeing streaks? All I'm seeing so far is a bit of twinkling.

Bill: You will see a meteor every now and then. It should get better between 3 and 5 a.m. Central time.

Mary: we saw a several in Issaquah, WA a few minutes ago...a nice night here in Western Washington.

Bill: Congrats!

Sqthru: Could these meteors pose a threat to the ISS?

Rhiannon: The chances of a Perseid meteor hitting the ISS is rare, though the ISS does get hit by meteoroids regularly. It is armored and is very well-protected so there has never been severe damage from them. The ISS armor protects against meteoroids up to 1" (2.5 cm) in diameter.

jerry-Balt.MD: Does our Radiation Belt affect these or other meteors? I would think the icy debris would vaporize do to heating.

Bill: No.

john_campbell: why are we not worried about these hitting the Earth? How are we so sure they will be small enough or fast enough to burn up?

Danielle: Don't forget -- they are also very fragile.

john_campbell: I am in Moreno Valley, California. Do I look East?

Bill: Look straight overhead.

Joanie55: How big can these particles get???

Bill: The biggest are about the size of golf balls.

kalinka10: Thank you NASA TEAM.....and thank you for all the answers

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Danielle: You are very welcome! ☺

rw_edwards: Today is not so good, schedule-wise, we're in Southern California. If we can avoid light pollution, what will we expect (frequency-wise) for tomorrow, 10 PM-ish?

Bill: Not many at 10 p.m., maybe 40 per hour around 4 a.m.

Liberalinsc1: If Faster Meteors are Hotter? Does that mean there IS some Friction in Space ?

Rhiannon: There is friction in our atmosphere, where the particles are burning up and are 'meteors'. There is not friction in space where the particle is called a meteoroid.

Future_Astronomer: Please answer my question!!! does the debri from comet swift tuttle orbit the sun?

Bill: Yes.

Benr: It's quite a hassle that all the best astronomical events happen at night! ;)

Danielle: That's why they invented coffee! ☺

Sparkleplentie: Does looking straight up apply wherever you are viewing from?

Rhiannon: Yes. ☺

Delphiki: Thank you for hosting such a fantastic viewing experience for those of us who cannot see it tonight. We really appreciate it. Can never get enough of this side of life. Cheers to you all! Hope everyone gets to see a great show tonight ;]

Rhiannon: Great! So glad you are enjoying it.

Phillip: Do you know how much mass of Perseids burns in Earth atmosphere on each shower, and how much mass of Perseids remains in Space?

Bill: Haven't calculated it.

Aliineth: I don't see if you answer my question, can I see from Brazil?

Bill: If you are north of 32 degrees south latitude and the sky is clear.

isaac_in_long_beach: i'm in long beach, without a car, but i'm within biking distance of the ocean. since our beach faces south, i should have a good view of the eastern horizon down the coast. would this be a decent viewing place for tonight?

Rhiannon: Yup! Though don't look directly to the east. We recommend looking up as you will see the most sky that way and Perseids are seen all over the sky.

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walkie74: It's 11 now in Northern California. Isn't the peak going to be somewhere around 6 AM?

Bill: More like between 3 and 5 a.m. The sky will be too bright at 6.

Jessicazhu: how early in the morning would be best to see them?

Bill: Between 3 and 5 a.m.

Chrisc: Is it possible to find meteor pieces on the ground or do they all turn into dust? If so, what's the best strategy to find some?

Rhiannon: If a meteor reaches the ground it is called a meteorite. And that happens quite frequently! And many pieces have been found. Not Perseids though. They are not dense enough to reach the surface of the earth and they get entirely burned up in the atmosphere.

lefayad1991: how big are these meteors?

Bill: 0.1 to 1 millimeter.

XCalibre97: Are the huge tail with visible fire and bright be considered a fireball. I saw one a while ago and it was amazing. I see them constantly here in Alberta.

Bill: If the meteor is brighter than the planet Venus, no matter how long the tail.

Felix: What is the differnece between a star and a sun?

Bill: No difference.

Photon: How high above the earth are the meteors located?

Rhiannon: Perseids are burning up in the atmosphere between 66 and 50 miles up!

Tabby: are the meteors close to you and how big are they?

Danielle: The Perseids burn up several miles above our heads. The Perseid fireballs we've detected with the NASA All Sky Fireball Network have burned up at heights of 55 miles on average. They are fractions of a mm to mm in size.

StardustAI: I just love watching this each and every year! With cloud cover at my current location I am thankful for the STREAM feed and NASA Socials efforts tonight! I can still remember the first time I got out of town and away from the light pollution to see this event in all of its wonder. Now matter ow hard I tried I just could not get myself to stop saying ouutloud -WOW (6EQUJ5 for all of you true space geeks). Wondering about cosmos is one thing but knowing the true wonder of it is something that can only be experienced when we observe it first hand. Here's my question: Have ther been any notable scientific discoveries made or assisted by the observation of meteor showers?

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Bill: Define "notable."

skywatcher12: We are starting to see more here in North Ga. Just saw 5 huge ones that were very bright white !!! So far around 15 total

Rhiannon: Woohoo! That's great. ☺

Michael: Is it possible that Earth could intercept Swift-Tuttle, and if so have there ever been any projections on when that may be?

Bill: No.

Brianna14: Im in Knoxville, TN will I be able too see it?

Danielle: Yes, if you have clear, dark skies.

R.S.D.: Hello Bill can i ask where your located ? Tks

Bill: Marshall Space Flight Center in Huntsville, Ala.

Future_Astronomer: Any way to make the video from your ustream less fuzzy?

Rhiannon: There is an inevitable amount of noise. Sorry about that. We have been seeing meteors in the feed though! Hope you have too. ☺

Tbell: will perseids happen only tonight

Bill: No, you will be able to see Perseids tomorrow night and a few until the end of this week.

Blahblah: Any idea on the average size of the Perseids once they hit our atmosphere?

Bill: 0.1 to 1 millimeter.

va3: How long on avg is each meteor visible

Danielle: A second, often less, typically.

p3ns317: Sorry to ask another question, but it is possible that you could see a shooting star break up into a few pieces at the end, because I'm think I might of saw that happen?

Rhiannon: Yes! Larger meteors fragment as they are burning up, that is what you probably saw.

Globex: If Earth had no gravity, would the meteors just float indefinitely in space? Is that what they generally do until they come in contact with our atmosphere?

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Bill: The Perseids are running into us, so Earth's gravity is not really a factor. They orbit the Sun just like other bodies in the solar system.

CelticDream: Thousand Oaks, CA where do I look?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Cole08: Are you suppose to look overhead in all states

Bill: Yes.

Littlepinkbus: will someone please tell me where to look im in nashville tn

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Salzar: What's the average size of these meteors?

Bill: 0.1 to 1 millimeter.

Phillip: Bill, Danielle and Rhiannon I want to thank you all for your great answers and kindness. Do you have twitter accounts to follow you ?

Danielle: You are quite welcome! Thanks for joining us! Bill is on Twitter as MeteorScientist I believe. We also have a Facebook page called NASA Meteor Watch.

john_campbell: i just saw the biggest trail i have ever senn in so cal desert

Bill: Congrats!

Markmark: What is the average size of the meteors when they pass into our atmosphere.

Rhiannon: There are a huge variety of sizes, the larger the particle, the more infrequent we will see it. There are radars we receive data from that see 12,000 meteors per night the size of a piece of dust. Our all-sky cameras see several meteors per night that are cm-sized.

Jesurie: i stay in northeastern colorado and saw two thin small ones and one thick long one...it was amazing

Bill: Congrats!

skywatcher12: You stated they will be around for a very long time. Do this particles go through other planets' atmospheres?

Bill: The orbit of Swift-Tuttle passes close to Earth, so no, the particles do not go through the atmospheres of other planets.

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Missjj: I seen two

Bill: Congrats!

Robby: In Ocala FL.Saw 12 after midnight,some bright ,some not. Woke up my 10 year old who had always waited but never seen them. After 10 in 15 minutes he was very excited!!

Danielle: Great!!!

GinaD: How fast does the comet Swift-Tuttle travel?

Bill: Depends on its distance from the Sun. When it is near the Earth, it moves about 25 miles per second.

Adrey: How come we don't see the meteors come straight at us, they tend to be sideways

Rhiannon: If you were looking directly at the radiant (the point in the sky where the meteors appear to come from), you would see them come straight at us and would just be a dot, not a streak. So it is best not to look directly at the radiant. It is best to just look straight ahead. Hope you see many meteors tonight!

Adrey: Are you guys watching the sky while answering our questions?

Bill: Too busy answering questions.

R.S.D.: Can any of them make it to earth ?

Danielle: Perseids are too small and fragile and move too quickly to survive all the way through the atmosphere.

Jesurie: why does your viewing tip say avoid looking at the waning crescent moon if possible

Bill: Because moonlight messes up your night vision.

Indygal: Do you have a date range for the shower in October and the Leonids in November?

Bill: The Orionids are active around Oct. 21st. The Leonids are active around Nov. 17th.

Mithra: can we see perseids during the day?

Rhiannon: No. There have been daytime fireballs from huge meteors, however, and those are very rare. Would love to see one of those during my lifetime!

Felix: So if there is no difference between a star and a sun when people say they saw a shooting star its really just a meteor right?

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Danielle: Meteors are often called "shooting stars" or "falling stars"

Tbell: how often would you see the meteors now compared to about 3-5am if it is around 2am right now

Bill: About two thirds.

linecho6: I just came back from outdoor and say a few..awesome !! Hope everyone enjoys the night and Thanks to all the experts for the chat

Danielle: You are very welcome!

Adrey: Can people in airplanes see them better or worse than those of us on the ground?

Bill: Airplane windows are not clear, so ground dwellers have it better.

Karishma: I am in a suburb of houston, texas. Which is the best direction to look? My balcony faces the north.

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Joanie55: I have a strange question for the NASA team, can meteor showers affect planes in the sky????

Rhiannon: Nearly all meteors burn up far higher than an airplane would fly.

Christina: here's a crazy question, does this ever intersect Mars? Just Curious 'ity'

Bill: No.

Batman: is it possible for a perseids to fall to the ground?

Bill: No. They burn up at sixty miles altitude.

R.S.D.: Were newbie's here but can anyone tell me where we can get a live satalite view of our area so we can see when we may get a better break in the cloud's ? All nite & morning we have had 2 - 3 break's in cloud's but never all clear.

Bill: http://www.nasa.gov/connect/chat/perseids_2012.html

PEREZ77: Do the ISS astronauts avoid spacewalks during this meteor showers?

Bill: There are none scheduled, but we always take meteor showers into account when evaluating space walk risk.

rw_edwards: If this huge debris cloud is from the comet swift-tuttle, and it'll be around for centuries... how big does this make swift-tuttle?

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Rhiannon: Comet Swift-Tuttle is about 26 miles in diameter.

Blahblah: I assume it's possible, yet highly improbable, but has anyone heard of or seen two Perseids collide after entering our atmosphere?

Bill: The odds are vanishingly small.

Astrobrit: Will these meteors be impacting nearby celestial bodies that don't have their own atmosphere, such as our moon? If they reach that far, what would the extent of the damage be to the surface? Small holes? Large holes? Craters? Thank you for your feedback.

Bill: They can hit the moon and leave small craters under a meter in diameter.

Jaronl: are they bright enough to see on an overcast sky?

Bill: No.

R.S.D.: Can you'll tell us the best site's to look for pic's & video's of them later in the day ? Tks

Danielle: The NASA All Sky Fireball Network posts black and white images and movies of meteors seen by a network of cameras operated by the NASA Meteoroid Environment Office. See <http://fireballs.ndc.nasa.gov>. The site is updated each morning.

Claire: Can you them through just a regular window?

Bill: No. You need to go outside.

David_100: is it possible to see over 100 meteors at the same time ?

Bill: Not simultaneously.

Teresa: I am just coming back in from watching the sky. We have seen some awesome ones. Some with really long tails.

Danielle: Sweet! 😊

Jesurie: so if i see a meteor here in colorado will someone in alabama be able to see the exact same meteor?

Bill: No, Colorado is too far away. In order to see the same meteor, you generally need to be within a hundred miles of each other.

va3: About how many meteors per hour are expected at 3 am

Bill: Somewhere around 1 per minute, sixty per hour.

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skywatcher12: They seem to be coming from different places in the sky . Why is this ?

Rhiannon: The Perseids may be all over the sky, but they are all appearing to emanate from the constellation Perseus. You may be seeing some Southern Delta Aquarids (another active meteor shower) or just background (sporadic) meteors as well. On any given night you can see about 8 meteors per hour.

Sandhu4401: I am currently in Northern California. Will I be able to get a good view now or should I wake up early in a few hours?

Bill: Rates will be best just before dawn.

rw_edwards: About how big would debris have to be to make it to the ground? That is, what is the smallest...?

Bill: Depends on the speed, but it would take about a meter-sized meteor to produce meteorites on the ground.

Jessicac: what side of the sky should i be looking at?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Coolju001: why are stars flashing on the loive feed

Danielle: They are twinkling due to turbulence in the atmosphere.

Moderator Brooke: Thanks for hanging in there with us. We have about 30 minutes to go on our live chat. Our experts are doing a phenomenal job of answering your great questions. It's getting late, and the Perseids rates are increasing. Tell us what you're seeing in your skies.

StardustAI: By "notable" I was thinking of something that has changed our previous understanding of some basic scientific concept .

Bill: The very notion of rocks falling from the sky altered our concept of meteors, which was thought to originate in the atmosphere, before the early 1800s. Thomas Jefferson, upon hearing of the discovery of meteorites in New England, commented, "I would sooner believe two Yankee professors would lie than stones fall from the heavens."

Jeffd: About how big are the perseid meteors?

Bill: 1 millimeter.

Joanie55: Thank you NASA team for answering questions!! YOU ALL are the best and thank you for this opportunity to share this iwth you online!!! This is fascinating!!!!!!

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Bill: You're welcome.

Adam73950: Whats the peak time for tonight, or have we already passed?

Bill: Between 3 and 5 a.m.

Coolju001: i live in illinois i have not seen anything but am not in a dark area so i guess that is why i dont see them

Danielle: Light pollution will affect the number of meteor you see. But you also need to let your eyes get used to the dark. That can take 30 minutes or more. Additionally, the rates should increase as the Perseid radiant gets higher in the sky, so there should be more opportunity to observe meteors if the weather stays clear.

15528493: What is the mean velocity of these debris?

Bill: 60 kilometers per second or 130,000 miles per hour.

Thay: did past chicago already?

Rhiannon: Nope! If you have clear skies you will still be able to see Perseids until dawn, and then tomorrow night again!

Omar: Will the meteor shower be seen on the east coast?

Bill: Yes, if the sky is clear.

Jannyteach: I'm just outside of Chicago. We saw 4 bright ones streak by. What a show.

Danielle: Great to hear that!!

Teresa: How come we only pass once every 133 years, but pass through the debris every year?

Bill: Because the debris is smeared out all along the comet orbit. Think of it like a ring of debris.

MeGaOsO: Is it possible to watch it from Venezuela??

Bill: If you are north of 32 degrees south latitude and the sky is clear.

rw_edwards: Will this chat be logged and saved somewhere after?

Danielle: Yes, I believe a transcript of the chat will be placed on this chat page.

Jesurie: so does the size of the meteor have anything to do with the size of the trail they leave behind?

Bill: Yes, the bigger the meteor the longer the trail.

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Mark_H.: Saw 3 in about 10 minutes in KY

Danielle: ☺

Sqthru: Could the International Space Station be impacted by a meteor?

Rhiannon: Yes, there is a chance of this happening. There is a risk to any spacecraft from meteors. We at the Meteoroid Environment Office (MEO) have models to try to predict the risk to spacecraft from meteors. We use visual, radar, and other optical observations to calibrate our meteor shower forecasts, which are used by spacecraft operators. The ISS in particular is often hit by meteors but is armored and can protect against meteoroids up to 1" (2.5 cm) in diameter.

Jackeline: Where does the name "Perseid" come from?

Bill: Meteor showers get their name from the constellation in which their radiant is located. Perseids appear to come from Perseus, hence the name Perseids.

Christina: how big is the telescope that we're seeing the feed through?

Danielle: The feed is from a low-light level video camera, not a telescope.

jerry-Balt.MD: Any chance we can catch some of these debris in Aero Gel and return them for study? Or do we already know the composition of Swift-Tuttle?

Bill: There are no spacecraft up there to do this.

GinaD: Why can you see the most meteors in the early morning hours?

Rhiannon: It is a combination of the radiant being highest (the point in the sky that the Perseids appear to come from -- in the constellation Perseus), and also travelling through the most dense part of the stream.

Mouseki: Pardon if this is a daft question: I have seen meteor streaks as well as what looks like an individual dot flying through the sky (not a satellite). Are the "dots" meteors as well?

Bill: The dots are probably no meteors.

Scallywagon: I am in the Yukon by skagway Alaska it is just now getting dark enough to see them Can't Wait !!!

Rhiannon: Fantastic! Hope you see many!

melisuh29: will 530 be a good time to see more

Bill: The best time is between 3 and 5 a.m.

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Saana: Will the live feed stop when the chat stops?

Danielle: No, it will keep going. Hopefully the weather will cooperate!

jessicac : peak at 3-5am local time or e.t.?

Bill: Local time.

Bbk: any of them hit earth?

Bill: All of them are hitting Earth --- they are burning up in the atmosphere.

Beattyb: If this one is suppose to have between 80-100 per hour, is there another one that has more?

Rhiannon: The Geminids in December can have between 100-120 per hour in ideal conditions. Though it often gets less notice since it is very cold in America to stay out at night observing in December!

Gabs: what time would we possibly seen them in los angeles?

Bill: Between 3 and 5 a.m. local time.

Blahblah: Thanks for the chat and the live feed! I've seen one so far myself, about to head outside and chill under the stars for the rest of the show! Thanks again!

Danielle: You are very welcome!

Omar: The sky is pink where i live not pitch black like on the ustream, will i still be able to see the meteor shower?

Bill: If the sky is clear and you can see stars, you can see Perseids. Rates will be best just before dawn.

Astrobrit: Before I miss the opportunity, I'd like to thank you guys for answering our questions. You've been awesome and very informative. I didn't get to see any activity in the Irish sky tonight [too cloudy], but you've made it a fun experience nonetheless!

Bill: You're welcome.

Percy: how long does it take swift-tuttle to orbit the sun, and how eccentric is the orbit?

Rhiannon: <http://ssd.jpl.nasa.gov/sbdb.cgi#top> entering in Swift-Tuttle into JPL's Small Body Database will provide a host of information. It is a great site! Its period is 133 years and eccentricity of .96.

Andy: What direction should I look towards?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

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Janyflux: can I simulate the perseids with stellarium?? how? :c

Danielle: I know you can show a simulated meteor shower in stellarium, but I'm not familiar enough with that software to know if you can choose a specific meteor shower or not. Sorry!

John: Can moonlight affect the view?

Bill: Yes, it can ruin your night vision.

Grnmojave: I am in the high desert of so ca, when is the best time to watch, I saw one about 15 min ago

Bill: Between 3 and 5 a.m.

Cloudsovercharlotte: where in north carolina can i find dark skies? away from light pollution?

Bill: If the sky is clear and you can see stars, you can see Perseids.

KPalma: Has the International Space Station ever been impacted by a meteor?

Bill: Yes, it is hit all the time by small stuff which leaves small pits in the outer skin of the station. Nothing major and certainly nothing has ever penetrated the station armor.

Vance: Is there another minor shower tonight also. I've noticed 5 or 6 going south to north tonight roughly from the same area in the last hour or so?

Rhiannon: Yes! Several showers are active right now. Check out fireballs.ndc.nasa.gov and scroll through the last few days to see the different showers we have seen in our all-sky cameras.

Moderator Brooke: Hi everyone -- on the Ustream feed, what you're seeing is a light was turned on by the allsky camera. Once that's turned off, the view will go back to normal. Give us a couple of minutes.
☺

Jwally: once and for all...can you please tell me the difference between asteroid and meteor?

Bill: Size. If the object is bigger than a few meters in diameter, it is considered an asteroid. Meteors are typically millimeter to centimeter size objects.

Jimbotter: Could the Swift-Tuttle comet ever threaten the earth as it approaches our orbit in the coming centuries? Are there any active measures that Earthlings can take to disrupt a comet's orbit? Or maybe we'll just all be living on Mars by then??

Rhiannon: We know Swift-Tuttle's orbit well enough to know that it will NOT threaten earth.

Omar: I am in virginia, will i be able to get a good view now or should i come back later?

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Danielle: The rates should increase as the night goes on, as the Perseid radiant gets higher in the sky. But you can also see them now. One thing to keep in mind -- meteor observing takes patience. You also need to let your eyes adapt to the dark for the best chance of seeing meteors. This can take 30 minutes.

Henryblack: are there other yearly showers?

Bill: Many. Go to www.imo.net for a list.

EvoLegend: im seeing them on the live stream

Danielle: Great!

Laniharrison: What time would we see them near Stockton, California or Sacramento, California?

Bill: Between 3 and 5 a.m. is best.

Heavenleanna: Will the live feed still be going after the chat stops?

Danielle: Yes it will!

rw_edwards: Thank you NASA team for giving me so many things to watch tonight (the sky, the live feed, the chat ...)...

Danielle: It's been our pleasure!

John: what time is best between 3 and 5 a.m ?

Bill: Do not expect to see Perseids if you are going to be outside for just a few minutes. It takes thirty minutes for your eyes to dark adapt.

Ooggaa: any direction more likely to see them?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Roz: Thank you for answering all our questions! How likely is it to see a fireball in this shower?

Rhiannon: Our all-sky cameras will see many fireballs tonight. Last night (pre-peak) we already saw 16 multi-station meteors. Check out fireballs.ndc.nasa.gov for videos and stills.

KPalma: Is there any other Meteor shower as big as the Perseid in the following months & when? Will everyone around Earth be able to see them? or does people in North America have more chances than people in Asia?

Bill: Geminids in the middle of December. They are visible in both hemispheres.

Starlover: What's the best time to view it in the Chicago suburbs?

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Danielle: The Perseid rate will increase as the night goes on. The hours before dawn, between 3 and 5 am local time, are likely to be best.

Michael: Thank you guys for staying up all night and answering questions from all of us. This is like the coolest and most interesting thing ever. I am enjoying and learning a lot from all of the Q and As. I was bummed because we are cloudy all night in Kansas and I didn't think that I would get to see this. I'd brew ya all a cup of coffee if I could. Thanks again. You guys rock

Rhiannon: Thanks so much for the feedback! So glad you are enjoying it. :)

Tanya_W.: Does the space station crew see anything special when the meteors cross into our atmosphere?

Bill: No.

Matthew: Here in Nashville I have seen 47 meteors in the past hour and I just want to say thank you for answering our questions. We really appreciate it

Danielle: Happy to hear that! Thanks for joining us!

melisuh29: If sunrise is 6:41 can I see them up until then? and will there be more tomorrow night

Bill: You can see Perseids tomorrow night, but the rates will be lower.

Saaga: Pronounced per-see-idz?

Danielle: Yes

Season: I looked just up & northeast & saw one.

Bill: Congrats.

Mramirez: And I would also like to tell you thank you and thanks for making this happen. This live chat is great!!

Bill: You're welcome.

TakeMe2URLeader: Are they visible in the LA area at this time?

Bill: Yes, but the rate will increase as dawn approaches.

Fakerobot: Which time zone for 3-5am?

Danielle: Your local time

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Drtanuki: Thank you Bill, Brooke, Danielle, and Rhiannon and Team for this year's chat/program and including The Latest Worldwide Meteor/Meteorite News in your links! -Dirk Ross...Tokyo

Bill: You're welcome.

Newtonfigtree: i have noticed on nights of a meteor shower there always seems to be extra dew/moisture on the ground. Does the meteor effect the weather like that?

Bill: No.

skywatcher12: when you talk about the radiant point are you talking about the point of entry into our atmosphere?

Danielle: Meteor showers are named after their radiant -- or the point in the sky from which the meteors appear to originate. The Perseids are named for the constellation Perseus.

ILoveNasaa: Will the meteor shower be visible in virginia? Ive been watching the sky for a hour and saw nothing.

Bill: It is visible; are you outside and looking straight up without any lights around you?

McCloud: This has probably been asked before, and I'm sorry because I just got here, but my lady friend and I are getting tired so I'll ask anyway: around when can it be seen best on the east coast, in the western virginia/north carolina area?

Danielle: In the hours before dawn, your local time.

Addre: If we lived on mars could we see them from there?

Bill: No, you cannot see Perseids from Mars.

Vohpoh: i was curious how much of the noise we see is from electrical noise from the long exposure/amplification and how much is from the compression?

Bill: The noise is background noise from the camera. Right now there is a light on near the camera which will hopefully go off soon.

Moderator Brooke: Hey night owls, we have about 10 more minutes in our chat, so if you have questions, please go ahead and submit them. We'll be going offline at 3 a.m. EDT. If you can stay up, keep watching the skies on our Ustream feed. Better yet, head outside and catch the show live! Peak viewing rates will be from 3-5 a.m. your local time.

Jnjnl: may i ask where the moderators are from?

Bill: Alabama.

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Adrey: How many times faster are the meteoroids hitting earth than Usain Bolts 100meter world record (100m per 9.63 seconds)?

Rhiannon: Interesting question! That would put Bolt's speed as an average of 10.38 meteors a second. The Perseids you see tonight will be going 59000 meteors per second. Much faster. ☺ A Perseid would run 100 meter dash in 0.0017 seconds. Meaning Bolt would not have even moved a single meter by the time the Perseid won the race!

Meagan: Is that cloud cover on the stream?

Bill: There are passing clouds.

Moderator Brooke: The Ustream feed is back to normal! A few wispy clouds, but nice Perseids have been spotted.

Jnjnl: which direction in the sky is best to look at?

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Laniharrison: NASA WHAT IS UP WITH YOUR USTREAM?!?! WHAT IS GOING ON!?

Danielle: The meteor feed camera is located at an observatory. An observation session has just begun. For safety reasons, they turn a light on at the observatory while the telescopes are being set up. It looks like the light is now off!

Jackeline: What is the application for iOS/Android that has been mentioned called? What does it do?

Bill: It's called Meteor Counter and helps you count/identify meteors. The data is sent to a server where we can look at it.

Beattyb: did it just get really cloudy in Huntsville or is my streaming not working :)

Rhiannon: There was a light on for a bit, but now it is off! Slightly cloudy here but hopefully it will clear again soon. The live-feed will stay on even when we end the chat.

Navajer: is it reasonable for meteors to go from west to east...or north to south? as i have seen?

Bill: Yes.

Etaoin: Thank you for taking the time to answer our questions! This chat has been very informative and helpful.

Rhiannon: You are so welcome! Thanks for your interest. ☺

Fakerobot: Bill, what other meteor showers would you recommend for casual sky watchers?

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Danielle: The Orionids in late October and the Geminids in mid-December are pretty good!

Beattyb: Will you have a live feed during the Geminids?

Danielle: We plan to at this time.

Lids: Sao Paulo - Brazil has any chance of observing them?

Bill: You will be able to see Perseids, but very few.

KPalma: has nasa ever examined a meteor that hasnt disintegrate ????? p.s u guys are awesome !!! :)

Bill: Nope.

Mayaor: do you think if i have a camera with a long shutter speed it will capture the light no matter what or might it not be getting it

Rhiannon: If you can do a long-exposure (5-10 minutes) you should hopefully catch a few Perseids! We have had others give good reports on taking images of meteors.

Udbaker: What is the best direction to view the shower in the southeast

Bill: Lie on your back and look straight up. Avoid looking at the Moon.

Sarahjeanehill: Thank you NASA :-)

Bill: You're welcome.

Chloe: Thank you very much for being here and taking our questions! You guys rock!

Bill: You're welcome.

Forford: What if your not in a really dark area? because im in a neighbourhood

Rhiannon: If you can drive away from the lights, that would be ideal. But also being outside for a while will allow your eyes to dark-adjust and aid you in seeing many more meteors.

Codyj: What about viewing in Central Texas area?

Bill: Lie on your back and look straight up. Avoid looking at the Moon. The best time is between 3 and 5 a.m.

KPalma: when the meteors are falling do they make a sound ???

Danielle: When you are out observing meteors you won't usually hear any audible sounds. Some hissing sounds and sonic booms have been reported for VERY bright meteors (esp Leonids). But this is very rare.

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Chexmix: Does that mean if we continue to watch the Ustream feed it should peak nicely?

Rhiannon: We are hoping so!

jcao219: i saw a few

Bill: Congrats!

FG: Do these meteors ever hit the ground on earth?

Rhiannon: Perseids burn up by 50 miles ahead. They never reach the ground.

BrenGalaxy: will we be able to see anything tomorrow night?

Bill: Yes, but the rates will be lower than tonight.

Bilal: What to do if its too cloudy?

Bill: Try for tomorrow.

15641561: i live in wisconsin, can i get an estimated time for the metor shower :D?

Danielle: The meteor shower is active now! But rates will increase as the night goes on, and the radiant gets higher in the sky.

Peeka Woou: we just came back inside and saw alot of them in the sky! Also saw two of them at once. Was really exciting!

Danielle: I'm so excited for you! ☺

Saaga: What's the best aspect of working in the Meteoroid Environment Office?

Rhiannon: Getting to be a part of NASA's space program. NASA is a great place to work with interesting projects all over the place. I feel lucky to be a part of this organization.

Kevinseattle: Is this from ther same Swift-Tuttle Comet that fell into jupiter a few years ago, or was that another comet named by the same folks?

Bill: The comet that hit Jupiter was called Comet Shoemaker-Levy 9, totally different from Swift-Tuttle.

ILoveNasaa: I just saw a perseid on the ustream! Thank you so much NASA for hosting this live stream!

Bill: Congrats and you're welcome.

Moderator Brooke: We have time for just a couple more questions...

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BrenGalaxy: will there be meteorites tomorrow night as well?

Rhiannon: Yup! If your skies are dark and clear you should see up to 40 Perseids an hour.

AbsolutSpaceGuy: Will you check the Fireball cameras for possible Perseid images on Monday?

Danielle: The All-sky fireball cameras will post images/movies of tonight's fireballs tomorrow morning at <http://fireballs.ndc.nasa.gov>

Alex: Are the Perseids supposed to be very bright? Like a shooting star? Because I think I just saw one in Boston a few minutes ago

Bill: Congrats! You probably saw a Perseid.

Euchre: I saw one on my drive home tonight

Bill: Congrats!

Saskatoon: It's a perfect night in Saskatoon, Sask. Canada. We saw over 70 meteors in 1 1/2 hours!! Just Awesome!!!

Rhiannon: Fantastic!

KPalma: could a meteor touch mount.everest ???

Bill: Not a Perseid.

Beattyb: Thank you all very much for taking the time to answer our questions. Hope you are able to spend a little time watching them yourselves.

Rhiannon: Thanks! I'm hoping to lie out after we are done with the chat here and see some for myself.

llockert: Ive been taking pictures all night long. Long shutter will catch a few, I have also been sitting with my remote in hand and shooting as I see them streak across the sky. Both have great results with different looks, Im currently in the middle of a 1hr and 30 min open shutter, It should capture the rotation with a few streaks runing through the star trails.

Danielle: Keeping my fingers crossed for you!!! ☺

Meagan: Is tomorrow the only other day, or will there be very low rates of meteors after tomorrow night? How long does the shower technically last?

Bill: Low rates until the end of the week.

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Duck: Thanks to the chatters for asking some really interesting questions, and thanks NASA peeps from great, easily understandable answers!

Danielle: No problem! Thanks for joining us!

BrenGalaxy: what time is it estimated for ontario to see them>

Bill: Between 3 and 5 a.m.

skywatcher12: Does Nasa know where the comet travels too for 133 yrs?

Danielle: Yes, the orbit of comet Swift-Tuttle is fairly well known

Mramirez: how fast are they zipping by?

Rhiannon: Perseids are hitting the atmosphere at 59 km/s or 132,000 miles per hour.

aww_yeah_science: Will the meteor shower happen again tomorrow night?

Bill: You will see Perseids tomorrow night, but the rates will be lower.

doug071173: I live in southern california, about 20 minutes east of los angeles, does anyone know when would be the best time for me to view the meteor shower and in what direction should I look

Bill: Between 3 and 5 a.m. Lie on your back and look straight up. Avoid looking at the Moon.

Moderator Brooke: Okay, Perseid watchers, that's about it for our live chat. Many thanks to our experts: Bill Cooke, Danielle Moser, and Rhainnon Blaauw. Our sincere thanks to all of you for helping us watch this great summer meteor shower. Remember, best viewing rates tonight will be between 3-5 a.m. your local time. You can see some Perseids tomorrow night as well, just at a lower rate. You can also leave your comments and observations in the comments section at the end of this page. Thanks, and have a great evening!

StardustAI: Big thanks to all of the NASA moderators tonight, you guys rock!

Moderator Brooke: It was our pleasure. Thank you for being here