Comet A3 Tsuchinshan-ATLAS makes its closest approach to Earth (14 to 20 October 2024)

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Ezzy: Greetings listeners, and welcome to Star Diary, a weekly guide to the best things to see in the northern hemisphere's night sky. As we are based here in the UK, all times are in BST. In this episode, we'll be covering the coming week from 14 to 20 October. I'm Ezzy Pearson, the magazine's features editor, and I'm joined on the podcast today by Mary McIntyre.

Hello, Mary!

Mary: Hi, Ezzy!

Ezzy: So, Mary, what do we have coming up in this week's night sky?

Mary: Another busy week with lots to see, so we've got plenty of planets on show to look for. The biggest supermoon of the year. Some stars of the Pleiades are going to play hide and seek with the Moon, and hopefully, a naked eye comet plus debris from two other comets will be visible in our night sky.

Ezzy: Ooh, sounds like a lot to be getting on with.

Mary: Yes! So much going on at the moment. So I'm going to start off with the planets.

Venus is in the evening sky, moving from Libra into Scorpius. It sets at about 7:10PM, so although that's an hour and ten minutes after the Sun, it is still going to be struggling against the brightness in the twilight sky, so you're probably going to need binoculars to see it this week, but it is there and it's going to get better over the coming weeks.

Saturn is in Aquarius this week, visible as soon as it gets dark, about 17º above the southeast horizon. It sets at about 3:30AM in the morning, and on 14 October it's just 0.5º from the Moon, so that'll be a nice pairing to look out for. Saturn has some interesting things to look out for up close.

On 18 October at 9:30PM, there is a shadow transit of Saturn's moon Rhea, so that's the second largest moon of Saturn. So all of the big moons will produce shadow transits, and that's one that should be visible with a good sized telescope.

And on 19 October at 7:23PM, Titan is just 7 arc seconds below Saturn's south pole, so that's incredibly close to the planet.

So if you do look at the planet with a telescope or big binoculars, you should just see what looks like a star just below the South Pole, and that is Titan, Saturn's largest moon.

Neptune is to the upper left of Saturn in the evening sky, so it lies below Pisces. It's about 15.5º above the east southeast as soon as it gets dark.

Through the night it's going to move towards the upper left of Saturn and it's going to set about an hour and a half after Saturn does, so you'll have a bit longer to spot it. It is going to be around mags +7.8, so binoculars or a telescope are needed. Its moon Triton is mag +13.4 and with a large telescope you should be able to observe that continuing orbiting in a clockwise direction.

We talked about that last week so that's still going to be visible this week as well.

Jupiter is the brightest planet to see this week. It lies in Taurus so we've got plenty of chance to see it through the night. It's mag -2.3 so it's unmissable being the brightest thing in that part of the sky apart from the Moon. So that's awesome.

It's rising at about 8:40PM and then it's visible all through the night. Interestingly, the star N Tauri is really close to Jupiter all week and it's going to be less than 0.5º away on 20th. So if you look at Jupiter through binoculars, you will see the Galilean moons, but you will also see what looks like an extra moon, and that is that star within Taurus very, very close to the planet. So that should be easy to see.

Mars is in Gemini this week, so that is rising in the northeast at around 10:45PM at night, then remains visible all night long. It's mag +0.4, so it's still easily visible with the naked eye and you may see the reddish colour of Mars when you observe it.

Uranus is about 5.5º to the lower right of the Pleiades this week, rising about 7:15PM as it gets dark, then remains visible all night long. That is brighter than Neptune. So it's at mag +5.7, but you will still need binoculars or a telescope to observe it.

Finally, the most challenging of the planets, the dwarf planet Pluto, is currently at mag +14.5, so definitely a challenge. It lies between Capricornus and Sagittarius this week. It reaches its highest point at 7:30PM when it's only 15º above the southern horizon. It's going to set at about 11:30PM, so we're going to start losing Pluto, so we are in the kind of last couple of weeks of really having a chance of seeing it before it gets too low and lost in the twilight.

Mercury is also lost in the twilight this week, so we can't observe Mercury, unfortunately. But all the other planets are visible.

Ezzy: Yep, so definitely try and get Pluto if you haven't already. And we'll just have to wait a bit longer for Mercury to come back. It will be back. They always are.

Mary: Yeah, they always come back.

Moving on to the Moon. The Moon is going from a waxing gibbous through to a waning gibbous this week, and we have a full Moon on 17 October, which I'll talk about in a second, but on 14 October at 7:00PM Saturn is just 53 arc minutes above the Moon, so that's incredibly close.

Then at 10:15PM it's going to be 1.5º to the right of the Moon, so it always just demonstrates how the Moon and the planets are moving at a different rate and the way that the sky rotates means that planets can whip from one side to the other in quite a short space of time actually. So it's always fun to see the different distance between the planet and the Moon when you do observe it over a few hours.

Ezzy: I always forget just how fast the Moon moves across the night sky until you've got something like that when you can see it relative to something else that's remaining. I was about to say pretty static. Saturn is also moving across the night sky, but in relative terms, the Moon's moving a lot faster and just the reminder of that is quite striking.

Mary: I had a stark reminder of that when I was photographing the lunar occultation of Saturn last month. Boy, that happened fast. It was just take a quick video, blink, and it was gone. Like, I was more aware for the egress afterwards because I'd missed ingress because it all happened too quickly.

On 17 October, technically at 12:26PM, we have a perigee full Moon. And because the Moon's orbit is not a perfect circle, it is oval, there are times in the month when the Moon is closer to us, and when it reaches the closest point during a Full moon, people like to refer to it as a supermoon, and because it does appear about 30% brighter and about 12% larger in diameter.

That difference is not easy to perceive with the naked eye, but you can definitely see a difference in diameter telescopically. Maybe the brightness, but what tends

to happen is people go out and watch it rising. And because of the Moon illusion, the supermoon always looks massive. When in actual fact, the Moon is the same size when it rises as it is when it's at its highest point. But it's always fun to observe Moon rises.

Ezzy: Yeah. So the moon illusion there that Mary mentioned, that is when the moon is closer to the horizon, our brains sort of interprets it as being bigger. If you actually hold up your thumb to it, your thumb will perfectly cover the Moon when it's at the horizon and then if you do it again when it's much higher in the sky you can see it's the exact same size.

It's just the way that our brains interpret things because you've got something to compare it to that's closer and that kind of thing, which is a fascinating psychological effect to look at.

Mary: It is. And I like to photograph the Moon rising behind trees that are like two miles away, three miles away, because then the Moon is the same size as a massive tree on your camera sensor.

And when you crop that image, the Moon just looks like this enormous, big orb, which is how people do those really creative Moon shots. They're really striking Moon shots. They photograph the Moon rising behind a folly and they are positioned miles away from it. And it gives you that wonderful illusion in photograph form.

If you photograph the Moon rising against a tree in your garden, the Moon's tiny next to the tree. So, it's just about the angles really, and when you see it rising against a distant object, your brain is like, "I know how big a tree is, oh my gosh, the Moon is the same size as it." And it's fun to do it, every moonrise and moonset is the same, and it's the same with constellations actually, constellations look massive when they're near the horizon. So it is an interesting quirk of the human brain.

But if you was interested in how far the Moon is going to be away on that night it's 357,367, so its average is about 380,000. It's a kind of very small difference, really, when you break the numbers down. So it's still a long way away, but it is its closest of the year for that supermoon, so definitely go and watch that.

A couple of nights later, we have a 91% waning gibbous Moon is going to occult some of the stars in the southern part of the Pleiades. Some of those stars technically are naked eye visible, but with a gibbous Moon nearby, the glare of that is probably going to make it difficult to see that naked eye. But if you have binoculars, you will be able to watch those stars disappear behind the Moon and reappear again, because as we said, the Moon's moving at a different speed to the stars, so you can see some stars go away and then come out, and then another star will go away and come out again, and you can just watch that throughout that evening.

So yeah, binoculars are going to be better to observe that, really, but it is always fun watching a cluster disappear behind the Moon. Even if it is just the southern part of that cluster.

And finally, on 20 October at 11:00PM the Moon is going to be just 7º above Jupiter, so another close pairing with the Moon and a planet there.

Moving on to Comet A3 Tshuchinshan-ATLAS. Southern hemisphere observers have been getting a really nice view of this comet and it's going to reach its closest approach to Earth this week, the very beginning of this week.

So it's going to start off the week very low down in the west, but it's going to climb higher and higher through the week. And there are some actually really nice conjunctions with this comet. So if it has survived and we're getting a good show, maybe a naked eye visible comet, maybe about mag -2.0.

Its tail could be up to 15º long or more. We really don't know what it'll do, but on 14 October, it's going to be only 6º above the western horizon, but the next day

it's moved up 3º, so it's climbing higher in the sky every day. As it does that, it's going to fade, but because it's getting higher, it's going to be easier to see because it's not lost in the murky stuff that you get really low to the horizon.

But on 15 October, It's a really good time to try to find this comet because it's going to be just 1.2º above Comet 13P Olbers.

Ezzy: Wow.

Mary: So that is a going to probably be around mag +11.0 so you are going to need a telescope to spot that, but two comets in the same field of view is always really special. But if that wasn't good enough it's only going to be 1.5º below M5 globular cluster and just to the lower right are a pair of interacting galaxies. So if you've got a kind of small refractor with a good field of view. You're going to have a lot of objects in that field of view. That is going to be pretty spectacular kind of group of conjunctions to have that comet nearby.

Ezzy: Yeah.

Mary: And if it does put on the show we're hoping for, that's going to be a pretty awesome sight. So...

Ezzy: I am looking forward to seeing the pictures that come from that one. I think there's some really good astrophoto opportunity there. So hopefully if anybody's listening to that, if you do get out there and you manage to capture any of that going on, please do send in those pictures to contactus@skyatnightmagazine.com. We've got a link down below about how you can submit your pictures because we print the best ones in the magazine. But yes, we're very much looking forward to seeing those.

Mary: Yeah, good stuff. So we also have the Orionids meteor shower this week. So it's active technically from 14 October till the end of October.

The peak is usually overnight around the 20 to 23. It's got quite a broad peak because the debris stream has spread out quite a lot so we don't have a sharp peak like we get with some. This is actually debris from Comet 1P Halley. So the press always say, see Halley's Comet tonight, when you won't see Halley's Comet, you'll see debris from Halley's Comet burning up in the atmosphere.

Ezzy: There's a very important word missing from that sentence.

Mary: Yes. So Zenith Hourly Rate is around about 25, which doesn't translate to a huge number of meteors. So the best visual rate is usually about 8 to 9 an hour, but I'm happy with that. I love meteors of all kinds and frequencies. We may see a bit less because we do have a gibbous Moon in the way and the radiant is rising at about 10:00PM and the rates are going to really pick up in the third week of October.

As with all meteor showers, the dawn sky is the best time to see them because the dawn side of Earth is facing the debris stream so we get more meteors. That's the case with all meteor showers, after midnight, before dawn is definitely the best time to observe that. Orionids are extremely fast. So we talked about the Southern Taurids last week, which I'm going to talk about again in a second, but Orionids are moving at 67km/s.

So they are incredibly fast, fast, fast, fast. Like when you see them, you blink and they're gone. So they're always very different in character to the Taurids that you may see at the same time. So yeah, it's always interesting the different colours and the different speeds and characteristics that different meteors debris has, it's fascinating to dig into.

Ezzy: Because it's definitely, you notice, when I think of a shooting star I do think of like the fast ones. A shooting star as opposed to like a meteor, that's like one of those fast ones. And then you've got those, I've been lucky enough to see one fireball as it happened to have been going past whilst I was driving down the motorway.

That seemed to move so slowly, it took me a minute to work out what it was that I was seeing because it was moving so slowly. And that's one of the things I love about meteor showers is the more that you see of them and the more that you look, you get to see this entire breadth of different things that are out there.

Mary: And because of the composition of the comet that left the debris is different each time, the colours that they burn up in the atmosphere can be different. So Perseids are often very green, other showers may be more likely to be red or orange. Celestial fireworks, it's always good fun.

There is Northern and Southern Taurids, Mithrashar is also active this month. It's not as active as the Orionids. This is debris from Comet 2P Enck, and that has split itself into two distinct separate debris streams, so we have the Northern and the Southern Taurids. So the peak of the Southern Taurids was actually on the 9/10 October, but the Northern Taurids doesn't peak until 12 November, and the zenith hourly rate for those is only around 10.

But with no Moon interference, we should get the maximum rate from those showers. Some years we get enhancement because of the Taurid Swarm, which is a kind of more dense part of the debris field. So it's always worth observing the Taurids because you never quite know if you're going to get a surprise and get a few more very bright fireballs in amongst all the usual meteor shower stuff. And as always, before dawn, definitely the best time to look for those.

So that's everything for this week.

Ezzy: Sounds like we've got some really great things to see this week. Remember, if you want to keep up to date with all of the latest goings on in the night sky, do subscribe to the Star Diary podcast.

But to summarise this week again:

Mercury remains out of sight, but the rest of the planets are still on show. The best will be Jupiter, which remains close to star N Tauri throughout the week, which will appear to give it a fifth moon, while Saturn will also be visible with several of its moons.

The Moon goes from waxing gibbous to waning gibbous with a full Moon happening on 17 October.

And that will be the biggest full Moon of the year. On 19 October, you'll also get the chance to see the Moon occulting several of the stars in the Pleiades star cluster. Comet A3 Tsuchinshan-ATLAS continues to be a really promising comet, and it should be getting higher in the sky every day. On 15th, it will be near to Comet Olbers, and will also be near two interacting galaxies as well for a great photo opportunity.

And finally, the Orionids meteor shower runs from 14 to 31 October, peaking around 20 to 23 October, and also the Northern and Southern Taurids continue as well.

So lots of great things to see in the night sky, and we hope to see you back next week for even more stargazing highlights.

Goodbye!

If you want to find out even more spectacular sights that will be gracing the night sky, Be sure to pick up a copy of BBC Sky at Night magazine, where we have a 16 page pull out sky guide with a full overview of everything worth looking up for throughout the whole month. Whether you like to look at the moon, the planets, or the deep sky.

Whether you use binoculars, telescopes, or neither. Our Sky Guide has got you covered with detailed star charts to help you track your way across the night sky. From all of us here at BBC Sky at Night Magazine. Goodbye.

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