

AirSpace Bonus

To Gaze

Matt: Howdy AirSpace listeners. We're working hard to get season four ready for you. In the meantime we're bringing you interesting, kind-of related things into the feed.

Nick: Over the summer we collaborated with Diplo on companion tracks to his new album MMXX, it's called Under Ancient Skies and you can check it out on Spotify (wherever you get music?). The music is ethereal and otherworldly and the narration is all about the wonders and mysteries humans see when they look up.

Emily: We also did an audio tour of the night sky for a series of small, outdoor concerts Diplo gave. Today in the feed we have that narration for you. Done by the incomparable Becca Ljungren, an astronomy educator at the museum.

Matt: The tour is for the summer night sky so it doesn't match with what's up there now, but you can still lie back and imagine what you can see if you look up at a clear summer sky. The background music on this isn't Diplo, but when you're finished listening here, be sure to check out Under Ancient Skies.

Becca Ljungren:

To gaze up to the sky

Is an act as old as time

Just as flowers turn their faces

To the Sun

And animals use the light of the stars

To travel at night

We look up

And ask - what is it that I see, and what does it mean?

Over time, we have come to know

Familiar features in our sky

As the same planets, stars, constellations, and galaxies

Appear time and again

As orbits continue

And as our Earth turns.

We look up from this pale blue dot

And wonder.

So I ask all of you, on this journey with me, to wonder -

When you look up to the sky, what do you really see?

Stargazing begins

Not by opening our eyes, but closing them

Be content in the darkness of your eyelids

Our eyes adjust to the darkness (this will be important later)

We take in the smells, the feeling of earth

And clear our minds of the day.

For we now turn our minds, and our eyes, to the sky.

As you gently open your eyes, what do you notice first?

Are there still lights around you?

In the case of stargazing, the more light we take in, the less we actually see.

Light tries to trick us, making us believe there is nothing to see beyond it

This is why darkness is so important for gazing at the wonders of the universe.

As our eyes adjust to the night time sky, things begin to appear

Bright specks in our view, and in our imagination

We leave our bounds and explore these things

and the spaces in between.

Our eyes likes bright things

The Sun shines bright.. It means food, warmth, day,

We see brightness to the southwest, two small dots

Slightly to the left of where the Sun just set

You could easily mistake these dots for airplanes. But you might notice that they're light is steady.

They are some of the brightest things in the sky tonight

They are our neighbors, giants Jupiter and Saturn

They're bright because they are close.

Of all of our wandering neighbors,

They are the biggest.

Collections of hydrogen, helium and other elements

Gathered in our early solar system

As gas and dust swirled around our star.

Though they are neighbors

We are not the same

We are looking at gas giants that swirl with storms.

Volcanoes and icy oceans pepper their myriad moons

Giant rings, some visible, some not, encircling their bloated forms

We gaze at them, from our calmer planet

With only one moon

Feeling the pull of their massive presence

Even from here.

How do we know they are different from the multitudes of stars we see in the sky?

Because they are shining, never twinkling

Stars twinkle because they are so much farther away, and less of their light reaches us.

Jupiter and Saturn's closeness is seen in their steadiness.

We can find planets by looking to the same path the Sun and Moon travel through our sky.

This is the plane of our solar system, the ecliptic.

While our view of this path changes with the seasons, it's predictable

So we always know where to look.

These giants are not our only neighbors

One more planet appears tonight

Slightly to the southeast of where the Sun rose.

We are reminded of the bright, steady beacons

Of planets that we've encountered before, and find another, slightly fainter

Very orange version

Of that same thing.

We have found another neighboring planet - Mars

Giving us its signature rusty dust color

As it hangs steady in the sky.

Its dry, rocky surface, could have once teemed with water

Now only a whisper is found in rocks and ice caps.

This is our favorite planet to travel to and explore with robots.

We've sent orbiting satellites to take pictures from above

And rovers to traverse the planet from the ground

And we wonder -

Might humans one day walk upon its surface?

We have sent humans somewhere else before

Our closest neighbor.

Our Moon felt their footsteps half a century ago

Treading the dusty surface

And bringing back treasures

We still explore with our eyes

Some nights (And days, for the Moon can be up then too)

We can see the place they walked

A seemingly small, dark plain on our Moon's face,

Best seen during first quarter

And wonder what it will be like

If humans walk there again.

There is so much more out there

Than our little solar system.

With its little planets, orbiting round our little star.

There are so many more stars, billions in our galaxy alone

Shining bright so that our eyes can see.

Many of them even hosting

Their own planets

That might even be like our own.

Stargazing fosters patience

The farther you go

The longer you look

The more you see

Let's direct our gaze up and to the west,

And deeper, though almost just as bright

High above us, slightly toward the setting Sun,
We see Vega, part of the harp constellation,

It's the brightest star in the night sky that we can see from Earth.
It's bright because it is massive, [slowly]
Though it's so much farther away than our planets and our moons.
So far it takes the light it shines twenty-five years
To reach our eyes.

A sign of summer here in the northern hemisphere
Is The Summer triangle. [matter of fact, not slowly]
It's part of a familiar pattern in the sky called an asterism.
We can expect these stars as the seasons change.

We can even trace the triangle with our fingers.
From Vega, the brightest,
Down to the south
To Altair, part of the eagle
It is much closer than its fellow Vega, though not quite as bright
We continue to trace our fingers to the final star of the triangle
Slightly to the east
Our last star, Deneb,
part of the swan.
The constellation that is imagined flying down our galaxy,
The Milky Way,
Which seems to flow from that point, through the space between the other two stars.

As the Summer Triangle stretches wide above us
There are clusters of stars much closer together.

Some deceptively so,
But look close from our perspective
Some groups are actually bound together.
We look further to the east to see one such group
A small, fuzzy spot,
Slightly blue, forming the tiniest hook of seven bright stars
(And so many others our eyes cannot detect).
These are the Pleiades, the Seven Sisters
Traveling through space together, bound by gravity.
Hot, blue, bright, young stars,
That will live fast, slowly drift apart
And likely be gone before our own star, the Sun, breathes its last breath.

11 of these stars are contained within our own galaxy.
Everything we can see with our eyes is within this neighborhood.
Almost everything past our neighborhood is a dream for our telescopes to make a reality.
The only thing
We can ever make out with our eyes
Is the tiny smudge of Andromeda
High in the north east - almost too hard to catch
Unless it's very dark.
An entire spiral galaxy
Like our own
And slowly creeping towards us.
It's our closest galactic neighbor
But not our only - as there are millions
Billions
Of other galaxies beyond.

And it is a wonder we see them at all.

As each is often farther than the next.

Giving us a glimpse over vast distances we can only ever imagine and barely quantify.

Everything we see is actually a snapshot of the past.

Light travels at a steady speed, never getting faster or slower.

Meaning what we see has already happened.

Even the light traveling between each of us, takes a bit of time to reach our eyes,

So when we see each other, we're seeing each other split seconds in the past.

To gaze into the vastness of space can leave us feeling small.

But rather, we should feel large

As we contain all that we see already within us.

In us, we find the elemental

Building blocks of life

That were once the building blocks of stars

Thrown out through space

As those stars died

Feeding new stars like our own.

As we bring our thoughts back to Earth.

To this ground that holds us as we gaze,

Where we explore and come to know our universe

We realize that the only thing we can see is light

Light that's traveled so far and long to get here.

We dream of time machines, but we already live in one.

M27 We're constantly moving through space, constantly marching through time,

While the past beams back at us, showing us ancient skies.