

# S01B02 - Bonus: Peeping at Space: From Galileo's Spyglass to our Multiversal Musings

## The Multiverse Employee Handbook - Season 1

HOST: Greetings, my multiversal magnifying maniacs! I'm your lenticular liaison to limitless realities, here to take you on a whirlwind tour through the history of cosmic peeping. Buckle up, because we're about to zoom through 400 years of telescope history faster than you can say "quantum superposition"!

Our tale begins in 1608, when Dutch spectacle-makers like Hans Lippershey, Jacob Metius, and Sacharias Jansen all had the bright idea to stick two lenses in a tube. Voila! The telescope was born. But it was our old pal Galileo Galilei who really pointed it skyward in 1609, probably after a wild night of too much vino and not enough stargazing.

Galileo's cosmic peep show revealed the Moon's craters, Jupiter's moons, and the phases of Venus. Suddenly, the heavens were less heavenly and more... lumpy. The Church wasn't thrilled, but that's a whole other can of cosmic worms that would take decades to fully unfold. Astronomers everywhere, however, said, "Grazie, Galileo!"

Fast forward through the 17th and 18th centuries, and we hit the "bigger is better" phase of telescope evolution. Astronomers were competing to build the largest refracting telescopes, probably compensating for something. These behemoths revealed Saturn's rings and gave us increasingly detailed views of the cosmos. But size does matter, and refracting telescopes had their limits.

Enter Isaac Newton in 1668 with his reflecting telescope. Instead of lenses, Newty used mirrors, proving once again that he was the smartest guy in any room. This innovation paved the way for even larger and more powerful telescopes.

One astronomer who took full advantage of this was William Herschel. In 1781, using a reflecting telescope of his own design, Herschel spotted a new planet: Uranus. Insert your own joke here, folks. Suddenly, the solar system was bigger than we ever imagined! It's like finding an extra room in your house that you never knew existed.

But Herschel didn't stop there. He built even larger reflectors that gave us our first good look at nebulae. Turns out, space is pretty foggy. These observations, building on ideas from philosophers like Immanuel Kant, led to the concept of "island universes" - the idea that some fuzzy patches in the sky might be separate

galaxies. It's like realizing that not only is your neighborhood bigger than you thought, but there might be entire cities out there you never knew about.

Now, fast forward to the late 19th century. Some genius decided to slap a camera onto a telescope, and astrophotography was born. Suddenly, astronomers could prove they weren't just making stuff up. We got our first photos of galaxies and better star catalogs. It was like Instagram for the cosmos, minus the filters.

But wait, there's more! In the 1920s, Edwin Hubble used the most powerful telescope of his time to show that those fuzzy patches weren't just nebulae—they were entire galaxies racing away from us! This discovery was like the universe hitting the "expand" button on a cosmic copy machine, leading to the mind-bending concept of an expanding universe.

Now, let's tune into the universe's whispers with the birth of radio astronomy. In 1933, Karl Jansky accidentally discovered that space is noisy. It's like he stumbled upon the universe's secret podcast! This led to the discovery of pulsars - the cosmic lighthouses of the universe - and the cosmic microwave background radiation, the universe's baby picture.

Fast forward to 1990, when NASA launched the Hubble Space Telescope. After a slight hiccup - turns out, even NASA needs glasses sometimes - Hubble gave us the Deep Field image, showing a cosmic Times Square of galaxies in a seemingly empty patch of sky.

Hubble also provided crucial data that supported the discovery of dark energy, the mysterious force causing the universe's expansion to accelerate. It's like the cosmos had one too many espressos and can't stop jittering. This discovery opened the door to ideas about multiple universes, each potentially with its own laws of physics. Talk about interdepartmental differences!

And now, drum roll please, we arrive at the James Webb Space Telescope, launched on Christmas Day 2021. This \$10 billion space origami sees in infrared, allowing it to peer through cosmic dust and potentially observe the earliest galaxies.

While Webb might help us understand the early universe better, potentially shedding light on cosmic inflation theories, it's important to note that detecting direct evidence for or against cosmic inflation is challenging and may require other types of observations.

As we wrap up our telescopic time travel, remember this: every time we've looked up with better tools, we've discovered something new and mind-blowing. With each new lens and mirror, we've peeled back layers of the cosmos, revealing not

just more stars, but more mysteries—like whether our universe is just one of many in an endless cosmic archipelago.

So, the next time you look up at the night sky, remember there's a giant, high-tech space detective up there, unraveling the mysteries of the cosmos. And who knows? Maybe the next big discovery is just a photon's throw away, opening our minds even further to what's possible in the vast cosmos—even in other universes, if they exist!

This is your ocular oracle, signing off. Remember, in the grand cosmic employee handbook, curiosity doesn't just kill cats - it builds telescopes and imagines multiverses. Keep looking up, my starry-eyed skygazers!