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OurStory Video: Telescopes and Observatories

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<http://americanhistory.si.edu/ourstory/v/observatory.html>

Codes:

JW = Jenny Wei

GC = Geoff Chester

“ “ =interrupting, pause

[] = not speaker's words

JW: Hi, I'm Jenny and I'm an Education Specialist here at the National Museum of American History. One of my favorite objects is this beautiful telescope. It's almost 150 years old and it was used by the famous American woman astronomer Maria Mitchell. This telescope is part of the museum now, and it isn't used any more, but when it was used, it was kept in a special building called an observatory. There's one not far from here. Let's go check it out.

JW: Hi Geoff.

GC: Hi Jenny. Welcome to the U.S. Naval Observatory.

JW: Thanks so much. So, this is really a part of the Navy?

GC: This is a big part of the Navy. It doesn't look like a ship but we are the people that are responsible for helping folks in the Navy learn something very basic, and that is where they are. If you're on a ship in the middle of the ocean and you don't know where you are, and you don't know

where you're going, then you're in big trouble. So we use the stars and we use the stars to determine time, and if you know time and positions of objects in the sky, you can determine your position on the surface of the earth.

JW: Wow. So, I guess astronomy really matters to our everyday lives?

GC: In more ways than one that's true. The ability for us to keep very precise time, which ultimately ties back into positions of objects in the sky, is something which is very critical for a lot of the technology that we take for granted today.

JW: Like what?

GC: Well, things like the GPS in your car that helps you get to grandma's house, the cell phone that just about everybody seems to have now and this thing that we call the Internet, you might have heard of it?

JW: Yes. Okay.

GC: But without the ability to synchronize computers, to synchronize all these different communications systems with a precise time scale, none of that technology would exist. We provide the time synchronization that enables that technology.

JW: So can you show me one of the telescopes that's been used to research here?

GC: Absolutely. Let's go.

JW: Alright. Great.

GC: Now into this door

JW: Okay. Ooh!

JW: This telescope looks a lot like the one Maria Mitchell used.

GC: It's essentially the same type of instrument. Maria Mitchell's telescope is a little bit older so the materials that it's made of are a little bit different. It's mostly brass and wood but the basic principle behind it is still the same. The basic idea behind any telescope is to gather as much light as you can and focus it to a point, so you can use a large lens such as the one we have here which is 12 inches in diameter and that lens focuses light down the length of the telescope tube to where you have an eye piece which is kind of like a little magnifying glass. You look through the eye piece and it magnifies the image that is formed by the lens. So this is the basic principle behind virtually any telescope. Now, in Maria Mitchell's day, the detector that was used for astronomical observations was the human eye. And astronomers would sit at the eye piece and sketch what they saw. Nowadays we use more modern detectors, much more sensitive than the human eye, and it allows us to record the data electronically so that you can tease out all of the information that's in there that your eye might otherwise not see. So, very few astronomers today actually look through telescopes the way Maria Mitchell did. But for me, I still get a chance and a lot of the fun looking through this old telescope. There's still something very magical about being able to look through a telescope and see the craters on the moon, the moons of Jupiter, the rings of Saturn, [and] the polar caps of Mars. That's something that once you've seen it, you'll really never forget it, and you'll always want to get another look.

JW: So an observatory is a special place to study the sky and Maria Mitchell worked in a building with a dome very much like this one....

GC: Very similar to this, yes.

JW: And telescopes haven't changed much in the way they work but they have changed in size and what they use at the end.

GC: That's correct.

JW: There's certainly is a lot to learn about astronomy. Thanks so much for showing us this special place.

GC: Absolutely, it's been my pleasure.