1
00:00:00,133 --> 00:00:01,000
[Music]

2
00:00:01,000 --> 00:00:04,500
I’m Ernie Wright. I work in the Scientific Visualization Studio

3
00:00:04,500 --> 00:00:06,900
at NASA’s Goddard Space Flight Center.

4
00:00:06,900 --> 00:00:08,700
We’re looking at a computer model

5
00:00:08,700 --> 00:00:11,233
of the view at the South Pole of the Moon.

6
00:00:11,233 --> 00:00:13,233
This is like a time-lapse to show the motion

7
00:00:13,233 --> 00:00:17,466
of the Sun and the Earth and how the shadows change over time.

8
00:00:17,466 --> 00:00:20,400
Things don’t rise and set in the usual way here.

9
00:00:20,400 --> 00:00:23,600
The sun travels around the horizon, never getting more

10
00:00:23,600 --> 00:00:26,033
than a degree and a half above or below it,

11
00:00:26,033 --> 00:00:28,933
so there are always these long shadows.

12
00:00:28,933 --> 00:00:31,566
And from here, the Earth appears to be upside-down

13
00:00:31,566 --> 00:00:36,733

and rotating backwards, but that's just because of our point of view.

14
00:00:36,733 --> 00:00:39,200
The Earth doesn't move much in the Moon's sky.

15
00:00:39,200 --> 00:00:43,233
It's always in roughly the same place, just sort of bobbing around.

16
00:00:43,233 --> 00:00:45,233
That's true everywhere on the near side of the Moon.

17
00:00:45,233 --> 00:00:47,200
It's a consequence of the Moon always pointing

18
00:00:47,200 --> 00:00:49,800
the same face toward Earth.

19
00:00:49,800 --> 00:00:51,666
It takes about a month for the Sun

20
00:00:51,666 --> 00:00:53,933
to make a complete circuit around the horizon,

21
00:00:53,933 --> 00:00:59,233
and every so often, it'll pass behind the Earth, creating an eclipse.

22
00:00:59,233 --> 00:01:03,266
I've slowed down time here a little so that it's easier to see.

23
00:01:03,266 --> 00:01:06,066
On Earth, that would be a total lunar eclipse -

24
00:01:06,066 --> 00:01:09,400
the Moon passing through the shadow cast by the Earth.

25
00:01:09,400 --> 00:01:14,000
But if you're standing on the Moon, it's an eclipse of the Sun.

26
00:01:14,000 --> 00:01:16,700
The terrain at the South Pole is especially rugged.

27
00:01:16,700 --> 00:01:19,533
The rim of Shackleton crater is in the foreground here,

28
00:01:19,533 --> 00:01:22,766
and the mountain off on the horizon is unofficially known as

29
00:01:22,766 --> 00:01:26,700
Mons Malapert - it's about 85 miles away.

30
00:01:26,700 --> 00:01:29,166
Shackleton crater is about 13 miles wide,

31
00:01:29,166 --> 00:01:33,333
not quite as wide as the Grand Canyon, but it’s twice as deep.

32
00:01:33,333 --> 00:01:36,600
Sunlight never reaches the crater floor, so temperatures there

33
00:01:36,600 --> 00:01:41,466
are around 300 degrees below zero Fahrenheit.

34
00:01:41,466 --> 00:01:43,366
This model of the terrain is made possible

35
00:01:43,366 --> 00:01:46,233
by Lunar Reconnaissance Orbiter, which has been mapping

36
00:01:46,233 --> 00:01:50,566
the surface of the Moon from lunar orbit since 2009.

37
00:01:50,566 --> 00:01:53,700
LRO’s maps will be incredibly important for exploring the Moon