
PART II
100
LUNAR DAYS

1
00:00:00,667 --> 00:00:10,444
[music]

2
00:00:10,444 --> 00:00:13,313
In the time before the Lunar
Reconnaissance Orbiter, most

3
00:00:13,313 --> 00:00:16,216
lunar orbiting missions had a
lifespan of one to two years.

4
00:00:16,216 --> 00:00:20,621
But now, LRO has shattered all
records and been at the Moon for

5
00:00:20,621 --> 00:00:24,791
one hundred lunar days – that's
eight years of data collection.

6
00:00:24,791 --> 00:00:27,928
This mission has truly ushered
in a new era of lunar and

7
00:00:27,928 --> 00:00:31,698
planetary science. One of the
biggest accomplishments is that

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00:00:31,698 --> 00:00:35,202
LRO's high-resolution camera has
been able to image almost the

9
00:00:35,202 --> 00:00:38,739
entire lunar surface, down to
one meter of resolution. This

10
00:00:38,739 --> 00:00:42,175
has opened a treasure trove of
new data about geological

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00:00:42,175 --> 00:00:45,345
processes and areas that may be
best suited for future

12
00:00:45,345 --> 00:00:49,349
exploration. One hundred lunar
days has also given us more time

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00:00:49,349 --> 00:00:53,253
study the Moon's far side in
more detail than ever before. We

14
00:00:53,253 --> 00:00:56,223
now know, for example, that the
Compton-Belkovich volcanic

15
00:00:56,223 --> 00:01:00,560
complex formed from a rare type
of lava about 3.7 billion years

16
00:01:00,560 --> 00:01:05,032
ago. This helps paint a new
picture of the Moon's history.

17
00:01:05,032 --> 00:01:08,001
The Moon has not only had a wide
range of complex geologic

18
00:01:08,001 --> 00:01:13,340
processes, but its volcanism may
have also changed over time. LRO

19
00:01:13,340 --> 00:01:15,909
has also been able to measure
something you may not have heard

20
00:01:15,909 --> 00:01:19,513
about: the lunar tide – or how
much the Moon's surface actually

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00:01:19,513 --> 00:01:23,583
flexes and cracks due to the
gravitational pull of the Earth.

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00:01:23,583 --> 00:01:26,053
There's still a lot to learn
about this ongoing process,

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00:01:26,053 --> 00:01:29,122
making our Moon an important
case study when thinking about

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00:01:29,122 --> 00:01:34,127
other planets and moons. Over
its lifetime of 4 1/2 billion

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00:01:34,127 --> 00:01:37,331
years, the Moon has also been
bombarded by all sorts of

26
00:01:37,331 --> 00:01:40,867
asteroids and comets. This has
left millions of impact craters

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00:01:40,867 --> 00:01:45,272
on the surface. For planetary
scientists, however, there had

28
00:01:45,272 --> 00:01:49,543
been no way to identify newly
formed craters. But when LRO

29
00:01:49,543 --> 00:01:53,447
arrived, all this changed. By
comparing pictures taken earlier

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00:01:53,447 --> 00:01:56,750
in the mission with more recent
images, NASA scientists have

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00:01:56,750 --> 00:02:00,420
discovered more than sixty new
impact craters, like this one

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00:02:00,420 --> 00:02:04,491
from 2013. And that’s not all.
LRO’s instruments are able to

33
00:02:04,491 --> 00:02:08,595
study both new and old craters
in ways we never have before.

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00:02:08,595 --> 00:02:12,299
LOLA, for example, helps create
topographic 3-D maps, and

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00:02:12,299 --> 00:02:16,570
Mini-RF has detected evidence of
water ice inside deep craters at

36
00:02:16,570 --> 00:02:20,107
the lunar poles. All of this is
important for space science as a

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00:02:20,107 --> 00:02:23,510
whole. Craters are used to help
determine the age of a surface,

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00:02:23,510 --> 00:02:27,214
how hot or cold a planet is, and
how thick a planet’s atmosphere

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00:02:27,214 --> 00:02:31,518
might be. Observing new impact
craters also gives us better

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00:02:31,518 --> 00:02:34,788
insight into what happens when a
meteorite strikes a planetary

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00:02:34,788 --> 00:02:39,626
surface. And this touches upon a
key point - our Moon is more

42
00:02:39,626 --> 00:02:42,329
than just a rock. It’s the
cornerstone for understanding

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00:02:42,329 --> 00:02:46,333
our solar system and beyond. It
has a dynamic history that we

44
00:02:46,333 --> 00:02:49,503
are still learning about and
features we are still

45
00:02:49,503 --> 00:02:52,205
discovering. By being at the
Moon for one hundred lunar days

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00:02:52,205 --> 00:02:55,308
and counting, we continue to
expand our knowledge of our

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00:02:55,308 --> 00:02:57,244
nearest neighbor in space, and
with that,