LUNAR GEOLOGY
FROM APOLLO TO ARTEMIS

1
00:00:01,234 --> 00:00:03,737
>> SAMPLE OF BOTH SIDES.

2
00:00:03,737 --> 00:00:06,539
I WOULDN'T BET ON IT.

3
00:00:06,539 --> 00:00:07,774
>> OKAY, I JUST GOT A CHUNK

4
00:00:07,774 --> 00:00:10,744
OF THAT SIDE.

5
00:00:12,312 --> 00:00:16,349
[INDISTINCT CONVERSATION]

6
00:00:20,286 --> 00:00:24,824
[MUSIC]

7
00:00:24,824 --> 00:00:26,092
>> CAN YOU TALK ABOUT

8
00:00:26,092 --> 00:00:27,994
KIND OF WHAT THE --

9
00:00:27,994 --> 00:00:28,695
WHAT WENT INTO

10
00:00:28,695 --> 00:00:29,829
YOUR SAMPLING STRATEGY?

11
00:00:29,829 --> 00:00:30,997
AND HOW YOU CHOSE

12
00:00:30,997 --> 00:00:32,365
WHICH SAMPLES TO BRING BACK?

13
00:00:32,365 --> 00:00:33,199

>> THE IDEA WAS TO GET

14
00:00:33,199 --> 00:00:34,901
AS-AS BROAD A SPECTRUM

15
00:00:34,901 --> 00:00:35,935
OF NEW SAMPLES

16
00:00:35,935 --> 00:00:36,836
THAT WE POSSIBLY COULD.

17
00:00:36,836 --> 00:00:38,938
AND THAT TURNED OUT PRETTY WELL.

18
00:00:38,938 --> 00:00:42,409
AND, IN FACT, WE-WE SAMPLED, UH,

19
00:00:42,409 --> 00:00:44,277
AT LEAST EJECTOR.

20
00:00:44,277 --> 00:00:45,445
MELT -- WHAT WE CALL

21
00:00:45,445 --> 00:00:46,413
MELT EJECTOR

22
00:00:46,413 --> 00:00:48,681
FROM THREE MAJOR BASINS,

23
00:00:48,681 --> 00:00:50,116
MAYBE FOUR.

24
00:00:50,116 --> 00:00:51,785
UH, WE SAMPLED, UH, FRAGMENTS

25
00:00:51,785 --> 00:00:52,952
THAT ALMOST CERTAINLY CAME FROM

26
00:00:52,952 --> 00:00:54,621
THE DEEP MANTLE OF THE MOON.

27
00:00:54,621 --> 00:00:55,989
WE DIDN'T KNOW THAT AT THE TIME.

28
00:00:55,989 --> 00:00:56,623
>> YEAH.

29
00:00:56,623 --> 00:00:57,424
>> THAT'S ONLY RECENTLY

30
00:00:57,424 --> 00:00:58,391
THAT WE FIGURED THAT OUT.

31
00:00:58,391 --> 00:00:59,125
>> UH-HUH.

32
00:00:59,125 --> 00:01:01,861
>> AND THAT, UH, WE ALSO, UH,

33
00:01:01,861 --> 00:01:02,929
THEN ADDED TO

34
00:01:02,929 --> 00:01:04,998
OUR BROAD KNOWLEDGE AND, UH,

35
00:01:04,998 --> 00:01:06,399
HISTORY OF THESE

36
00:01:06,399 --> 00:01:07,567
VOLCANIC ERUPTIONS

37
00:01:07,567 --> 00:01:08,468
THAT HAVE OCCURRED ON THE MOON

38
00:01:08,468 --> 00:01:10,003

OVER TIME.

39
00:01:10,003 --> 00:01:11,371
NOW, WHEN YOU'RE --

40
00:01:11,371 --> 00:01:12,038
GO TO THE MOON

41
00:01:12,038 --> 00:01:14,207
ON THE WAY TO MARS, JESSICA,

42
00:01:14,207 --> 00:01:17,110
THAT, UH, UH, THAT EDUCATION,

43
00:01:17,110 --> 00:01:18,244
I THINK YOU'RE GOING TO GET

44
00:01:18,244 --> 00:01:19,646
ON THE MOON

45
00:01:19,646 --> 00:01:21,414
WILL BE VERY RELEVANT TO MARS.

46
00:01:21,414 --> 00:01:22,382
BUT MARS, OF COURSE,

47
00:01:22,382 --> 00:01:24,417
DOES NOT HAVE THAT

48
00:01:24,417 --> 00:01:25,385
MICROMETEORITE

49
00:01:25,385 --> 00:01:26,653
IMPACT ENVIRONMENT

50
00:01:26,653 --> 00:01:27,587
THAT WE HAVE ON THE MOON,

51
00:01:27,587 --> 00:01:28,555
'CAUSE IT HAS

52
00:01:28,555 --> 00:01:29,722
A SMALL ATMOSPHERE.

53
00:01:29,722 --> 00:01:30,356
>> MM-HMM.

54
00:01:30,356 --> 00:01:31,057
>> ABOUT A HUNDREDTH OF THAT

55
00:01:31,057 --> 00:01:32,125
OF THE EARTH.

56
00:01:32,125 --> 00:01:33,026
AND THAT FILTERS OUT

57
00:01:33,026 --> 00:01:34,160
THE SMALL IMPACT.

58
00:01:34,160 --> 00:01:35,795
THE MAIN WEATHERING PROCESS

59
00:01:35,795 --> 00:01:36,496
ON THE MOON

60
00:01:36,496 --> 00:01:37,897
ARE THESE MICROMETEORITE IMPACTS

61
00:01:37,897 --> 00:01:40,066
AND SOLAR WIND SPALLATION

62
00:01:40,066 --> 00:01:41,000
OF THE SURFACE.

63
00:01:41,000 --> 00:01:42,068

SOLAR WIND IS MADE UP

64
00:01:42,068 --> 00:01:43,470
OF HIGH-ENERGY PARTICLES.

65
00:01:43,470 --> 00:01:45,405
SO, THEY ACTUALLY ERODE, UH,

66
00:01:45,405 --> 00:01:46,673
THE SURFACES OF ROCKS,

67
00:01:46,673 --> 00:01:48,241
AS WELL AS, UH,

68
00:01:48,241 --> 00:01:50,043
CHANGE THE CHARACTER

69
00:01:50,043 --> 00:01:51,811
OF THE DEBRIS LAYER ON THE MOON.

70
00:01:51,811 --> 00:01:52,712
>> MM-HMM.

71
00:01:52,712 --> 00:01:53,780
>> ON MARS, THE DOMINANT

72
00:01:53,780 --> 00:01:55,248
CORROSIVE FORCE IS WIND.

73
00:01:55,248 --> 00:01:56,182
>> WIND, YEP.

74
00:01:56,182 --> 00:01:57,050
>> AND SO YOU'RE GONNA --

75
00:01:57,050 --> 00:01:59,185
IF YOU'RE USED TO STUDYING

76
00:01:59,185 --> 00:02:00,854
GEO-MORPHOLOGY HERE ON EARTH,

77
00:02:00,854 --> 00:02:01,788
AND IT INVOLVES WIND --

78
00:02:01,788 --> 00:02:02,789
>> Y-YOU'RE IN GOOD SHAPE, YEAH.

79
00:02:02,789 --> 00:02:04,257
>> YOU CAN LEARN A LOT --

80
00:02:04,257 --> 00:02:04,824
>> RIGHT.

81
00:02:04,824 --> 00:02:05,592
>> ABOUT WHAT-WHAT

82
00:02:05,592 --> 00:02:07,060
YOU'RE GOING TO SEE ON MARS.

83
00:02:07,060 --> 00:02:07,927
BUT ALL OF THAT COMES THAT --

84
00:02:07,927 --> 00:02:08,995
FROM STUDYING THE MOON.

85
00:02:08,995 --> 00:02:09,729
>> RIGHT.

86
00:02:09,729 --> 00:02:10,730
>> IF WE HADN'T HAD THE MOON,

87
00:02:10,730 --> 00:02:11,898
WE WOULDN'T UNDERSTAND,

88
00:02:11,898 --> 00:02:12,398

NECESSARILY,

89
00:02:12,398 --> 00:02:13,199
THE HISTORY OF THE EARTH,

90
00:02:13,199 --> 00:02:14,200
OR EVEN SPECULATE ABOUT

91
00:02:14,200 --> 00:02:15,335
WHAT IT MIGHT BE.

92
00:02:15,335 --> 00:02:17,103
AND SPECULATE INTELLIGENTLY--