1
00:00:10,470 --> 00:00:08,310
nasa's marshall space flight center and

2
00:00:12,790 --> 00:00:10,480
the johns hopkins university applied

3
00:00:15,589 --> 00:00:12,800
physics laboratory are creating a new

4
00:00:18,790 --> 00:00:15,599
generation of smart versatile robotic

5
00:00:20,790 --> 00:00:18,800
landers for exploring the moon asteroids

6
00:00:22,150 --> 00:00:20,800
and other airless bodies in our solar

7
00:00:24,390 --> 00:00:22,160
system

8
00:00:26,870 --> 00:00:24,400
as small as a golf cart but big in

9
00:00:31,830 --> 00:00:26,880
performance these multi-use landers will

10
00:00:35,270 --> 00:00:33,430
the landers can carry science

11
00:00:37,750 --> 00:00:35,280
instruments to study resources on the

12
00:00:40,150 --> 00:00:37,760
lunar surface and gather information for

13
00:00:41,670 --> 00:00:40,160

future missions to the moon

14
00:00:44,069 --> 00:00:41,680
they'll also make possible an

15
00:00:46,229 --> 00:00:44,079
international lunar network to answer

16
00:00:48,709 --> 00:00:46,239
fundamental questions about our moon's

17
00:00:50,150 --> 00:00:48,719
geology and the development of the solar

18
00:00:52,310 --> 00:00:50,160
system

19
00:00:54,389 --> 00:00:52,320
this network could monitor moonquakes

20
00:00:56,790 --> 00:00:54,399
and other geophysical activity deep

21
00:00:58,790 --> 00:00:56,800
inside the moon providing clues about

22
00:01:00,150 --> 00:00:58,800
the structure of its crust mantle and

23
00:01:01,910 --> 00:01:00,160
core

24
00:01:04,390 --> 00:01:01,920
the landers can be launched separately

25
00:01:06,789 --> 00:01:04,400
in a small launch vehicle or together up

26
00:01:09,350 --> 00:01:06,799
to four in one launch aboard a larger

27
00:01:13,830 --> 00:01:11,350
four landers could target four separate

28
00:01:15,910 --> 00:01:13,840
landing sites for example two on the

29
00:01:24,710 --> 00:01:15,920
near side of the moon and two on the far

30
00:01:28,789 --> 00:01:26,710
whatever its mission each lander will

31
00:01:31,270 --> 00:01:28,799
control its own landing pulsing its

32
00:01:35,830 --> 00:01:31,280
thrusters to slow and orient itself as

33
00:01:39,030 --> 00:01:37,190
the landers will use either a

34
00:01:41,429 --> 00:01:39,040
combination of solar arrays and

35
00:01:43,510 --> 00:01:41,439
batteries or the advanced sterling radio

36
00:01:45,590 --> 00:01:43,520
isotope generator to power their

37
00:01:47,510 --> 00:01:45,600
instruments and equipment

38
00:01:49,350 --> 00:01:47,520

either way they'll be hardy enough to

39
00:01:51,749 --> 00:01:49,360
withstand the extreme temperatures of

40
00:01:53,990 --> 00:01:51,759
the long frigid lunar knights and

41
00:01:56,870 --> 00:01:54,000
they'll be capable of at least six years

42
00:01:58,550 --> 00:01:56,880
of continuous operations on the moon

43
00:02:01,030 --> 00:01:58,560
these landers can touch down on a

44
00:02:03,270 --> 00:02:01,040
crater's rim or floor and collect soil

45
00:02:06,149 --> 00:02:03,280
samples or they can venture into the

46
00:02:08,150 --> 00:02:06,159
dark probing crater depths to excavate

47
00:02:11,350 --> 00:02:08,160
secrets

48
00:02:14,229 --> 00:02:11,360
how much water ice do the craters hold

49
00:02:16,309 --> 00:02:14,239
what other useful materials are there

50
00:02:18,630 --> 00:02:16,319
these next generation landers can help

51
00:02:20,790 --> 00:02:18,640
solve these mysteries and more allowing