1
00:00:00,820 --> 00:00:05,970
Music

2
00:00:05,970 --> 00:00:10,800
NARRATOR: If astronauts are to venture deeper into space than ever before, the trip is going to be a lot

3
00:00:10,800 --> 00:00:16,150
easier if they can use the materials they find along the way. The moon, for example,

4
00:00:16,150 --> 00:00:19,430
is full of oxygen and methane in its soil.

5
00:00:19,430 --> 00:00:24,270
Processing the moon's dirt into substances such as rocket fuel and breathing air could

6
00:00:24,270 --> 00:00:30,770
give astronauts the vital chemicals they'd need to travel to distant asteroids or Mars.

7
00:00:30,770 --> 00:00:32,150
Rob Mueller, Senior Technologist, KSC Surface Systems Office: We recently found that there's water

8
00:00:32,150 --> 00:00:38,900
ice on the moon. If we can capture the water ice, that's H2O, we can split the hydrogen and oxygen

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00:00:38,900 --> 00:00:42,850
and that's rocket propellant and rocket propellant is very important because when a rocket

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00:00:42,850 --> 00:00:46,990
lifts off from Earth, 90 percent of its mass is propellant. If we can make the propellant on the

11
00:00:46,990 --> 00:00:50,460
moon or on Mars, we don't have to bring it from Earth.

12
00:00:50,460 --> 00:00:53,570
Basically, we have everything we need inside the regolith.

13
00:00:53,570 --> 00:00:59,540

NARRATOR: Collecting the regolith is where RASSOR comes in. RASSOR is a robotic miner designed for a

14
00:00:59,540 --> 00:01:05,490
life spent digging into the lunar regolith and carrying it to a processing base 40 pounds at a time.

15
00:01:05,490 --> 00:01:11,380
Unlike scientific rovers NASA's operated on other worlds before, RASSOR is meant to move fast,

16
00:01:11,380 --> 00:01:16,530
avoid trouble and solve any problems that come up along the way by itself.

17
00:01:16,530 --> 00:01:20,170
All while operating 16 hours a day for years.

18
00:01:20,170 --> 00:01:25,510
MUELLER: This is not your typical NASA rover with lots of very sophisticated instruments on it that

19
00:01:25,510 --> 00:01:29,430
are quite fragile. This is actually very tough little robot. It can dig, it can climb,

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00:01:29,430 --> 00:01:36,880
it can flip over. If it does flip over, it can right itself up again.

21
00:01:36,880 --> 00:01:41,680
NARRATOR: One of the biggest challenges to overcome is the fact that machines working in the moon's

22
00:01:41,680 --> 00:01:46,560
reduced gravity can't count on their own weight to hold them down and let them work.

23
00:01:46,560 --> 00:01:51,630
RASSOR's answer to this problem is two barrel-shaped digging wheels that can rotate in

24
00:01:51,630 --> 00:01:58,020
opposite directions to give the robot the traction it needs to mine the dirt in the low gravity of the moon.

25
00:01:58,020 --> 00:02:01,190
A.J. Nick, RASSOR Development Team: Each drum only takes a little scoop at a time.

26
00:02:01,190 --> 00:02:05,380
It allows us to trench and dig down deeper.

27
00:02:05,380 --> 00:02:09,650
NARRATOR: Under development at NASA's Kennedy Space Center, RASSOR is expected to see several

28
00:02:09,650 --> 00:02:15,430
modifications as engineers and designers refine the design and put it through more testing.

29
00:02:15,430 --> 00:02:21,060
A.J. Nick: Each time we come up with a new design, we try to further it to get ready for a

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00:02:21,060 --> 00:02:25,760
mission and so each one will bring something new like a,