1
00:00:13,030 --> 00:00:11,589
hi everyone i'm heather paul out here

2
00:00:15,350 --> 00:00:13,040
with nasa's desert research and

3
00:00:17,670 --> 00:00:15,360
technology studies test team and with me

4
00:00:19,429 --> 00:00:17,680
is vivek now you have a really cool job

5
00:00:20,470 --> 00:00:19,439
can you explain what we have here and

6
00:00:21,590 --> 00:00:20,480
what you do

7
00:00:23,029 --> 00:00:21,600
yeah

8
00:00:25,830 --> 00:00:23,039
what we have here

9
00:00:26,790 --> 00:00:25,840
is a moon tire and what we do is try to

10
00:00:29,830 --> 00:00:26,800
develop

11
00:00:31,750 --> 00:00:29,840
tires that act like air filled tires but

12
00:00:33,990 --> 00:00:31,760
don't use any air and don't use any

13
00:00:35,910 --> 00:00:34,000

rubber cool so what we have on typical

14
00:00:37,430 --> 00:00:35,920
cars right now are these pneumatic tires

15
00:00:39,350 --> 00:00:37,440
the airfield ones kind of like what

16
00:00:41,590 --> 00:00:39,360
you're seeing here on the chariot right

17
00:00:44,389 --> 00:00:41,600
rover right and so why would we want to

18
00:00:45,350 --> 00:00:44,399
go away from that for lunar exploration

19
00:00:46,790 --> 00:00:45,360
so

20
00:00:48,229 --> 00:00:46,800
i guess the first point is for a manned

21
00:00:49,270 --> 00:00:48,239
mission you can't have an air filled

22
00:00:51,750 --> 00:00:49,280
structure

23
00:00:54,310 --> 00:00:51,760
because if it goes flat it aborts the

24
00:00:56,549 --> 00:00:54,320
mission okay good point flat tire's bad

25
00:00:58,389 --> 00:00:56,559
okay and uh the second point is that

26
00:01:00,790 --> 00:00:58,399
rubber doesn't work on the moon

27
00:01:03,510 --> 00:01:00,800
the temperature swings are extreme

28
00:01:06,149 --> 00:01:03,520
and in hot temperatures rubber soft and

29
00:01:07,670 --> 00:01:06,159
cold temperatures very brittle okay so

30
00:01:09,990 --> 00:01:07,680
can you talk me through a little bit i

31
00:01:12,149 --> 00:01:10,000
mean it's like metal and plastic and all

32
00:01:14,310 --> 00:01:12,159
kinds of cool stuff what do we have here

33
00:01:17,670 --> 00:01:14,320
so we work with some of the major tire

34
00:01:19,670 --> 00:01:17,680
manufacturers this is this happens to be

35
00:01:21,910 --> 00:01:19,680
a lunar tire we uh developed in

36
00:01:25,030 --> 00:01:21,920
partnership with michelin okay very cool

37
00:01:28,630 --> 00:01:25,040
they call it the tweel uh tire and wheel

38
00:01:30,630 --> 00:01:28,640

nice it deforms like a tire but requires

39
00:01:33,109 --> 00:01:30,640
no air rubber like we said

40
00:01:35,270 --> 00:01:33,119
and uh it looks very complicated but

41
00:01:37,670 --> 00:01:35,280
it's actually really simple okay

42
00:01:39,510 --> 00:01:37,680
if you put weight on this tire

43
00:01:41,990 --> 00:01:39,520
the outer band grows

44
00:01:44,149 --> 00:01:42,000
and these spokes go into tension

45
00:01:46,069 --> 00:01:44,159
so the amount that they stretch

46
00:01:48,389 --> 00:01:46,079
is the amount that this wheel will

47
00:01:50,389 --> 00:01:48,399
deform at the bottom okay so it deforms

48
00:01:52,069 --> 00:01:50,399
like a tire interesting now i have to

49
00:01:53,270 --> 00:01:52,079
ask you a serious question here because

50
00:01:55,670 --> 00:01:53,280
you know when we're talking about

51
00:01:57,670 --> 00:01:55,680
exploration we're designing rovers and

52
00:02:00,870 --> 00:01:57,680
spacesuits why should we be paying

53
00:02:03,030 --> 00:02:00,880
particular attention to designing a tire

54
00:02:04,789 --> 00:02:03,040
well i guess you can't have a vehicle

55
00:02:06,950 --> 00:02:04,799
without a tire good point and on the

56
00:02:08,229 --> 00:02:06,960
moon if you can't use the ones we have

57
00:02:10,869 --> 00:02:08,239
we have to do some technology

58
00:02:12,869 --> 00:02:10,879
development awesome well so how did you

59
00:02:14,229 --> 00:02:12,879
get to work at nasa

60
00:02:16,790 --> 00:02:14,239
i started out

61
00:02:18,630 --> 00:02:16,800
as an intern and liked it

62
00:02:20,470 --> 00:02:18,640
i thought it was a

63
00:02:21,589 --> 00:02:20,480

you know kind of like being in school

64
00:02:23,430 --> 00:02:21,599
but the projects were a little more

65
00:02:26,309 --> 00:02:23,440
complicated okay

66
00:02:28,070 --> 00:02:26,319
serious homework serious homework

67
00:02:31,270 --> 00:02:28,080
awesome so how long have you worked at

68
00:02:32,869 --> 00:02:31,280
nasa then since 2004. wow so a couple

69
00:02:34,550 --> 00:02:32,879
years here very good and you work at

70
00:02:37,190 --> 00:02:34,560
glenn research center i do in cleveland

71
00:02:40,070 --> 00:02:37,200
ohio excellent so you you've come from

72
00:02:42,150 --> 00:02:40,080
intern working as an undergrad at nasa

73
00:02:44,470 --> 00:02:42,160
all the way up to working with the lunar

74
00:02:46,470 --> 00:02:44,480
development for tires for exploration

75
00:02:48,470 --> 00:02:46,480
that's right that's really awesome i

76
00:02:50,070 --> 00:02:48,480
think that's cool well thank you so much

77
00:02:51,190 --> 00:02:50,080
it was really nice to talk to you today