1
00:00:00,770 --> 00:00:05,380
Music

2
00:00:05,380 --> 00:00:09,330
NARRATOR: Space is the ultimate destination for a set of tiny satellites that could show engineers

3
00:00:09,330 --> 00:00:16,540
new ways to build satellites in the future. But first, the payloads will prove their designs and structures

4
00:00:16,540 --> 00:00:25,180
during a projected June 15 launch in California's Mojave Desert.

5
00:00:25,180 --> 00:00:31,160
The satellites are 4-inch cubes and weigh less than three pounds apiece. In that small area,

6
00:00:31,160 --> 00:00:35,510
engineers have tucked everything a spacecraft would need to operate on its own and

7
00:00:35,510 --> 00:00:38,150
share what it finds out.

8
00:00:38,150 --> 00:00:43,300
The flight is also being watched closely as a model for trying out new or off-the-shelf technologies

9
00:00:43,300 --> 00:00:49,330
quickly before putting them in the pipeline for use on NASA's largest launchers.

10
00:00:49,330 --> 00:00:52,490
Shaun Daly, NASA Lead Mentor, StangSat: This is a high-altitude launch, about 20,000 feet, they

11
00:00:52,490 --> 00:00:58,920
may go a little bit higher than that, and it's a short duration flight but it's a little harsher environment for

12
00:00:58,920 --> 00:01:04,780
a shock environment than we might see so we're testing all of our systems, all the break points, the

13
00:01:04,780 --> 00:01:07,450

things you would expect to see happen.

14
00:01:07,450 --> 00:01:12,220
NARRATOR: There are four payloads going up on a small rocket designed specifically to the unique

15
00:01:12,220 --> 00:01:18,350
demands of the small satellites, which are commonly called nanosatellites or CubeSats.

16
00:01:18,350 --> 00:01:24,060
One, called PhoneSat, was built by NASA's Ames Research Center out of a smartphone.

17
00:01:24,060 --> 00:01:29,050
Although earlier models flew in orbit, the designers wanted to try new out new things before making

18
00:01:29,050 --> 00:01:34,690
another orbital flight. Launching on a small rocket gives them a chance to make a change and

19
00:01:34,690 --> 00:01:38,850
evaluate it before putting the payload on a full-up mission.

20
00:01:38,850 --> 00:01:45,260
Students from California Polytechnic Institute in San Luis Obispo and Merritt Island High School in

21
00:01:45,260 --> 00:01:49,700
Florida teamed up to build the CalPoly-9 and StangSat.

22
00:01:49,700 --> 00:01:54,570
The two measure vibrations and other conditions inside the rocket during launch and share the

23
00:01:54,570 --> 00:01:58,020
readings between each other on a Wi-Fi network.

24
00:01:58,020 --> 00:02:01,640
Scott Higginbotham, Project Manager, CP-9: The first benefit that we get is an actual flight data

25
00:02:01,640 --> 00:02:05,690
collection experiment, to see how much it shakes and how hot it gets.

26
00:02:05,690 --> 00:02:12,710
We have an interest in understanding what the true environment is so we can perhaps relax some of

27
00:02:12,710 --> 00:02:18,120
criteria for design on our spacecraft and that might allow them do more useful things.

28
00:02:18,120 --> 00:02:20,760
Maurisa Rorna, StangSat Team Member: Part of it that's really cool is, you see all the rockets

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00:02:20,760 --> 00:02:25,610
launching, you just go outside your front door and you see the rockets. But this is hands-on, it's not so

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00:02:25,610 --> 00:02:30,650
foreign, because, honestly, before this I was thinking rocket scientists they're so geeky and they don't

31
00:02:30,650 --> 00:02:37,010
know how to talk to you, but they do. And so, it's really cool to have that hands-on experience.

32
00:02:37,010 --> 00:02:41,210
NARRATOR: The upcoming launch will also test a new CubeSat launcher and carrier that weighs a

33
00:02:41,210 --> 00:02:46,390
third of the current model. That means future CubeSat engineers could have more weight for their

34
00:02:46,390 --> 00:02:48,570
own designs.

35
00:02:48,570 --> 00:02:53,690
Roland Coelho, Program Lead, CalPoly: We also are developing a new low cost deployer for NASA,

36
00:02:53,690 --> 00:02:58,860
where we're really trying to bring down the mass of the deployers, because for a NASA primary

37
00:02:58,860 --> 00:03:05,320
mission, mass is not really an issue. But for these nanosat launch vehicles, it is. So if we can save

38
00:03:05,320 --> 00:03:11,430

two or three kilograms on the deployer itself, that's a tremendous savings.

39
00:03:11,430 --> 00:03:16,320
NARRATOR: An experiment from participants in NASA's Rocket University will also evaluate the

40
00:03:16,320 --> 00:03:22,480
launch vehicle conditions throughout the flight. Rocket University is a professional program by the

41
00:03:22,480 --> 00:03:28,890
agency's engineers to develop technical expertise outside their specialty areas.

42
00:03:28,890 --> 00:03:34,250
CubeSat success at this point could clear the way for more such spacecraft missions that scientists

43
00:03:34,250 --> 00:03:39,660
say could have a big impact on how satellites are designed in the future and what kind of stresses

44
00:03:39,660 --> 00:03:43,200
they actually face during the climb into space.

45
00:03:43,200 --> 00:03:46,960
Roland Coelho: A lot of the payloads on this mission are monitoring the launch environments.

46
00:03:46,960 --> 00:03:54,020
So they're monitoring pressure, temperature, vibration - and also all of that data is extremely valuable

47
00:03:54,020 --> 00:03:57,750
to us as the integrators and also to the launch vehicle guys.

48
00:03:57,750 --> 00:04:02,500
Because that'll give us an idea of what the environments are and how we can isolate those

49
00:04:02,500 --> 00:04:06,670
environments for our future payloads once we go orbital.

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00:04:06,670 --> 00:04:09,940
NARRATOR: The launch is the second operational flight for the Garvey rocket,

51
00:04:09,940 --> 00:04:15,380
a liquid-fueled booster that returns safely to the ground under a parachute to be used again.

52
00:04:15,380 --> 00:04:20,300
A safe landing also will allow the CubeSats and research payloads to be evaluated and

53
00:04:20,300 --> 00:04:22,880
potentially fly another mission.

54
00:04:22,880 --> 00:04:28,430
Roland Coelho: The whole goal of this is to mature these technologies in all the different sectors to