1
00:00:08,250 --> 00:00:04,170
Music

2
00:00:08,270 --> 00:00:12,290
Silence

3
00:00:12,310 --> 00:00:16,320
Music

4
00:00:16,340 --> 00:00:20,360
All objects emit infrared radiation,

5
00:00:20,380 --> 00:00:24,460
and the characteristics of the infrared radiation

6
00:00:24,480 --> 00:00:28,480
are primarily dependent on the temperature of the object.

7
00:00:28,500 --> 00:00:32,510
One of the unique features of QWIP technology is the ability

8
00:00:32,530 --> 00:00:36,540
to what we call "band gap engineer."

9
00:00:36,560 --> 00:00:40,630
And that is we can spectrally tune to the QWIP

10
00:00:40,650 --> 00:00:44,660
detector to respond to certain wavelengths. One of the steps in

11
00:00:44,680 --> 00:00:48,670
developing a flight instrument, there's really a sequence of steps you

12
00:00:48,690 --> 00:00:52,700
have to go through. Obviously, you are going to develop it and test in the lab.

13
00:00:52,720 --> 00:00:56,760

But then, the next step is to really take it to the field and test it.

14
00:00:56,780 --> 00:01:00,820
And the step after that is to try and get it

15
00:01:00,840 --> 00:01:04,850
into an airplane and test it there. I mean, these are all small

16
00:01:04,870 --> 00:01:08,880
steps that are necessary to qualify it

17
00:01:08,900 --> 00:01:12,920
to be launch worthy. This process can really take many years!

18
00:01:12,940 --> 00:01:16,960
We look for applications, and many of them are science

19
00:01:16,980 --> 00:01:20,980
applications where our cameras can be tested on the ground.

20
00:01:21,000 --> 00:01:25,020
One such application is we've collaborated with the U.S. Geological

21
00:01:25,040 --> 00:01:29,070
Survey. They have great interest in trying to find caves on

22
00:01:29,090 --> 00:01:33,090
Mars and one of the features we think that a cave

23
00:01:33,110 --> 00:01:37,120
might exhibit is the cave entrance, the opening.

24
00:01:37,140 --> 00:01:41,160
We expect, since it is sort of tied to very deep in the ground,

25
00:01:41,180 --> 00:01:45,210
to have sort of a stable temperature and by

26
00:01:45,230 --> 00:01:49,310
doing that, we can watch the thermal contrast

27
00:01:49,330 --> 00:01:53,330
of the cave change relative to the environment from day time

28
00:01:53,350 --> 00:01:57,340
to night times. So, we've sort of verified that this would be a

29
00:01:57,360 --> 00:02:01,380
good technique perhaps, to find life. So, we have to

30
00:02:01,400 --> 00:02:05,410
figure out how to locate caves, before we send probes

31
00:02:05,430 --> 00:02:09,510
to look for life and this is an application.

32
00:02:09,530 --> 00:02:13,550
In order to convince people that that technology

33
00:02:13,570 --> 00:02:17,620
was mature enough for a space flight mission.

34
00:02:17,640 --> 00:02:21,700
We convinced them by showing them our ONE MILLION-pixel array

35
00:02:21,720 --> 00:02:25,790
and then they felt confident that the three hundred thousand-

36
00:02:25,810 --> 00:02:29,890
pixel array, you know, was a pretty low risk endeavor.

37
00:02:29,910 --> 00:02:33,950
So this latest development for the

38
00:02:33,970 --> 00:02:38,030

Landsat Data Continuity Mission, the instrument

39
00:02:38,050 --> 00:02:42,110
is called TIRS - the Thermal Infrared Sensor. We are interested

40
00:02:42,130 --> 00:02:46,140
in wavelengths that are between ten and thirteen microns.

41
00:02:46,160 --> 00:02:50,180
So, you know, my hope is that someday

42
00:02:50,200 --> 00:02:54,220
this will find it's way into an environment where

43
00:02:54,240 --> 00:02:58,250
it will be useful medically,

44
00:02:58,270 --> 00:03:02,270
to look for thermal pollution in rivers,

45
00:03:02,290 --> 00:03:06,290
monitoring food spoilage, residual hot spots

46
00:03:06,310 --> 00:03:10,330
after forest fires, pollution,

47
00:03:10,350 --> 00:03:14,360
um, obviously looking at volcanoes.

48
00:03:14,380 --> 00:03:18,400
Development over the years that we have been doing, ultimately led

49
00:03:18,420 --> 00:03:22,440
to the validation of this technology for a

50
00:03:22,460 --> 00:03:26,480
NASA space flight mission. That's a very hard thing to do!