
ENGINEERING

1
00:00:00,820 --> 00:00:04,480
[Music]

2
00:00:04,600 --> 00:00:05,680
[Volcano Rumbling]

3
00:00:13,040 --> 00:00:14,900
>>AVIRIS is a type of a camera.

4
00:00:14,900 --> 00:00:19,609
If you're on an airplane, for example, and
you take a picture with your iPhone, the picture

5
00:00:19,609 --> 00:00:21,670
will tell you things about what you're looking
at.

6
00:00:21,670 --> 00:00:25,380
It might tell you that there's reef there,
it might have nice colors, but your camera

7
00:00:25,380 --> 00:00:29,089
only sees in the visible part of the spectrum-
red, green, blue.

8
00:00:29,089 --> 00:00:35,030
But with AVIRIS you have a camera that essentially
has 224 detectors across the visible spectrum

9
00:00:35,030 --> 00:00:39,870
all the way to the shortwave infrared, collecting
the sunlight bouncing off of whatever we're

10
00:00:39,870 --> 00:00:44,430
looking at, and giving us a data cube, a spectrum,
of everything that you're looking at.

11
00:00:44,430 --> 00:00:47,600
Different things will have their own unique

spectrum.

12
00:00:47,600 --> 00:00:51,550
And therefore we can then compare that to
a spectral library to know what we're looking

13
00:00:51,550 --> 00:00:52,550
at.

14
00:00:52,550 --> 00:00:56,490
You're able to know things like how much
coral there is in a given reef, perhaps what

15
00:00:56,490 --> 00:01:00,070
type of species of a plant you're looking
at if you're over a forest.

16
00:01:00,070 --> 00:01:04,989
It's an augmented type of camera that gives
scientists a lot more information than a regular

17
00:01:04,989 --> 00:01:07,080
camera would.

18
00:01:07,080 --> 00:01:10,610
AVIRIS sits right above this window.

19
00:01:10,610 --> 00:01:15,980
When the pilots hit Q6 to begin recording
a line, the shutter here essentially retracts

20
00:01:15,980 --> 00:01:21,400
and exposes the scan head to begin scanning
during the flight line.

21
00:01:21,400 --> 00:01:25,830
After the end of each flight line the pilot
presses Q6 again and you have that shutter

22

00:01:25,830 --> 00:01:31,620
window go back in place, until you repeat
the process over each line.

23
00:01:31,620 --> 00:01:36,799
When I was a little kid, I wanted to be an
astronaut, I wanted to do engineering work;

24
00:01:36,799 --> 00:01:41,670
became an aerospace engineer, started working
at JPL, and got involved with imaging spectrometers,

25
00:01:41,670 --> 00:01:46,171
working both on the hardware, but also on,
essentially the mission logistics of what

26
00:01:46,171 --> 00:01:49,780
it takes to collect the data.

27
00:01:49,780 --> 00:01:53,690
I've been working with the principal investigators
for both the coral reef team and the volcano

28
00:01:53,690 --> 00:01:54,690
team.

29
00:01:54,690 --> 00:01:58,590
So when a scientist gives me information about
what area they're interested in, I go in Google

30
00:01:58,590 --> 00:02:02,560
Earth and I'll measure what the width of that
feature is, then I have another tool where

31
00:02:02,560 --> 00:02:07,310
I put in all the different parameters of the
airplane, the airspeed, the field of view,

32
00:02:07,310 --> 00:02:10,450
and I will plot out a given number of lines

that will cover that area.

33
00:02:10,450 --> 00:02:15,730
So a narrow coral reef section of an island,
it might only require one pass, but an area