



1
00:00:00,000 --> 00:00:05,040
(tone)

2
00:00:05,040 --> 00:00:12,500
(music)

3
00:00:13,714 --> 00:00:17,150
Fenway Park may be the home of
Boston's most beloved team, but

4
00:00:17,150 --> 00:00:19,987
another is about to
steal some headlines.

5
00:00:19,987 --> 00:00:23,090
This group consists of students
from MIT and Harvard who are

6
00:00:23,090 --> 00:00:25,959
getting the chance to build an
instrument that will help NASA's

7
00:00:25,959 --> 00:00:29,696
OSIRIS-REx spacecraft
explore the asteroid Bennu.

8
00:00:29,696 --> 00:00:33,400
This group of student scientists
are building REXIS - the

9
00:00:33,400 --> 00:00:35,502
Regolith X-Ray
Imaging Spectrometer.

10
00:00:35,502 --> 00:00:38,505
Its purpose is to collect and
image X-rays coming from the

11
00:00:38,505 --> 00:00:41,675

asteroid, to determine
its elemental makeup and

12

00:00:41,675 --> 00:00:45,178

distribution of elements
across the surface.

13

00:00:45,178 --> 00:00:47,748

Each student has a
unique task on the project.

14

00:00:48,500 --> 00:00:52,552

"I get to practice being a
thermal engineer and honing my

15

00:00:52,552 --> 00:00:54,312

thermal engineering skills."

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00:00:54,560 --> 00:00:59,560

"My role is to work with the solar x-ray monitor as well as some of the avionics side."

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00:00:59,560 --> 00:01:04,340

"On a daily basis I write test plans and
assembly procedures."

18

00:01:04,340 --> 00:01:07,334

"I work on the REXIS avionics system.

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00:01:07,334 --> 00:01:11,405

And what that is, is the electronics
that take the x-ray signals

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00:01:11,405 --> 00:01:15,345

from the asteroid, and
make sure they get back to the

21

00:01:15,345 --> 00:01:17,500

ground for the scientists to
process."

22
00:01:17,502 --> 00:01:21,140
"As systems engineer, I'm responsible for making
sure that all the different technical

23
00:01:21,148 --> 00:01:23,951
disciplines come together -
thermal, structures, avionics,

24
00:01:23,951 --> 00:01:27,554
software - they all come
together to make one working

25
00:01:27,554 --> 00:01:30,123
instrument that meets our
science requirements."

26
00:01:30,123 --> 00:01:33,727
And making sure everything stays
in check is Becky Masterson -

27
00:01:33,727 --> 00:01:37,464
the REXIS instrument manager and
the group's faculty supervisor.

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00:01:37,464 --> 00:01:40,334
"REXIS is an interesting
instrument on OSIRIS-REx in that

29
00:01:40,334 --> 00:01:42,469
we're a student
collaboration experiment.

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00:01:42,469 --> 00:01:46,106
The goal here is to educate
students, and the REXIS project

31
00:01:46,106 --> 00:01:48,542
has been a fantastic
way, you know, to do that.

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00:01:48,542 --> 00:01:51,378

Both undergrads and graduates go through this project and get a

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00:01:51,378 --> 00:01:56,550

real, a real-live view into what it is to build space hardware."

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00:01:56,550 --> 00:01:59,430

And building REXIS is an intense process with strict

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00:01:59,430 --> 00:02:02,180

contamination controls and elaborate software

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00:02:02,189 --> 00:02:03,190

and hardware testing.

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00:02:03,190 --> 00:02:06,210

And there's one thing every college student can relate to:

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00:02:06,300 --> 00:02:07,794

note-taking.

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00:02:07,794 --> 00:02:10,964

"On REXIS the reason that we have such careful procedures and

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00:02:10,964 --> 00:02:14,134

note-taking is that in the future if during an

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00:02:14,134 --> 00:02:18,405

environmental test or other integration activity we notice

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00:02:18,405 --> 00:02:22,609

an anomaly, we can try to trace it back to a root cause.

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00:02:22,609 --> 00:02:26,889

And if you have detailed notes it's easier to go back and

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00:02:26,889 --> 00:02:30,851

figure out what may have happened during assembly."

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00:02:30,851 --> 00:02:33,253

So what's the biggest challenge in building REXIS?

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00:02:33,253 --> 00:02:35,373

The answer may surprise you.

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00:02:35,380 --> 00:02:38,392

"Having students involved in REXIS has been a wonderful

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00:02:38,392 --> 00:02:41,028

experience; it's been an adventure.

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00:02:41,028 --> 00:02:43,630

One of the difficulties of it is that students are always coming

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00:02:43,630 --> 00:02:44,631

and going.

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00:02:44,631 --> 00:02:48,368

So you get a student in, they're here for a two years Masters and

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00:02:48,368 --> 00:02:51,320

they learn a lot, and they are doing great, and then they're gone."

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00:02:51,320 --> 00:02:54,640

So working on REXIS is
a bit like riding the "T" in

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00:02:54,641 --> 00:02:57,811

Boston - some students going
outbound some coming inbound.

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00:02:57,811 --> 00:03:01,515

But all are getting the same
collective learning experience.

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00:03:01,515 --> 00:03:03,950

"So the biggest thing I've
learned while working on REXIS

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00:03:03,950 --> 00:03:07,054

is really that instruments
like this and spacecraft like

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00:03:07,054 --> 00:03:09,056

OSIRIS-REx are
very, very complex.

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00:03:09,056 --> 00:03:11,792

It has a lot of dependencies, a
lot of requirements, a lot of

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00:03:11,792 --> 00:03:14,594

relationships and a lot of
design decisions that all impact

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00:03:14,594 --> 00:03:15,695

one another."

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00:03:15,695 --> 00:03:18,532

"REXIS provides a hands-on
experience for students

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00:03:18,532 --> 00:03:23,003

to build flight hardware for
a NASA mission, and that's

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00:03:23,003 --> 00:03:26,940

incredibly rare that as a
student you can build something

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00:03:26,940 --> 00:03:30,110

that's going to fly in
interplanetary space.

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00:03:30,110 --> 00:03:33,880

So this is like a lead in to a
future career in NASA,

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00:03:33,880 --> 00:03:36,000

a future career in rocket
science."

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00:03:36,000 --> 00:03:37,751

"That's exciting for me, I get a

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00:03:37,751 --> 00:03:40,887

kick out of thinking that, you
know, these pieces that I am

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00:03:40,887 --> 00:03:43,356

touching and this assembly that
I am building is actually what

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00:03:43,356 --> 00:03:46,116

is going to fly in space. So I think that's pretty cool."

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00:03:46,120 --> 00:03:47,660

And between Fenway and Boston's

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00:03:47,661 --> 00:03:50,564

other attractions, students must

feel completely spoiled with

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00:03:50,564 --> 00:03:53,667

their social life, right?

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00:03:53,667 --> 00:03:57,204

"Yeah, well, I don't
go out much (laughs).

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00:03:57,204 --> 00:03:59,539

I don't know (laughing).

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00:03:59,539 --> 00:04:00,874

What is there much to say?
(Laughing)

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00:04:00,874 --> 00:04:03,977

Usually I have to work on
REXIS."

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00:04:03,977 --> 00:04:05,045

So, while it's true

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00:04:05,045 --> 00:04:07,881

these students may strike out
trying to find that perfect

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00:04:07,881 --> 00:04:11,518

balance between schoolwork, a
social life, and working on REXIS,

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00:04:11,518 --> 00:04:14,488

as scientists they
are hitting a home run for the