
NASA

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00:00:02,346 --> 00:00:03,266
>> Hi, everybody.

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00:00:03,266 --> 00:00:05,806
I'm NASA's Josh Byerly here in
Mission Control, and I'm joined

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00:00:05,806 --> 00:00:06,916
by my friend Chris Edelen,

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00:00:06,916 --> 00:00:10,066
who is actually the
Expedition 34 Lead Fly Director,

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00:00:10,066 --> 00:00:12,116
and that means he's
got a fairly busy job

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00:00:12,116 --> 00:00:13,606
over the last five months or so.

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00:00:13,606 --> 00:00:15,536
But Chris is, you know,
we're getting ready to wrap

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00:00:15,536 --> 00:00:20,136
up Kevin Ford, Evgeny
Tarelkin, and Oleg Novitskiy.

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00:00:20,136 --> 00:00:22,836
You know, the time's almost
done onboard the Space Station.

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00:00:22,836 --> 00:00:25,066
So talk a little bit about
what this crew has done and,

11
00:00:25,366 --> 00:00:26,556
you know, what you

have been up to.

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00:00:26,696 --> 00:00:26,996
>> Chris Edelen: Okay.

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00:00:26,996 --> 00:00:28,686
Well, it's been a
very busy increment.

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00:00:28,686 --> 00:00:32,016
The focus has been primarily
on research and utilization,

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00:00:32,016 --> 00:00:33,496
putting the Space
Station to work.

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00:00:34,626 --> 00:00:39,396
In fact, the primary
focus of the crew

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00:00:39,396 --> 00:00:42,096
and their motto is
reflected in their crew patch

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00:00:42,386 --> 00:00:47,076
"from the Earth, for the Earth";
and that reflects their desire

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00:00:47,076 --> 00:00:49,856
to leave the confines of the
Earth's gravity field to get

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00:00:49,856 --> 00:00:52,936
above the atmosphere and
to live and work in space

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00:00:52,936 --> 00:00:56,426
and to conduct research that
not only advances the agencies'

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00:00:56,426 --> 00:00:59,026
exploration goals but also
benefits all of humanity.

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00:00:59,216 --> 00:01:00,886
>> Josh Byerly: So talk about,
they set a record -- right --

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00:01:00,886 --> 00:01:03,236
for number of hours spent
working on science utilization.

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00:01:03,236 --> 00:01:04,826
Talk a little bit about
what they've done and some

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00:01:04,826 --> 00:01:05,806
of the big things
they're worked on.

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00:01:06,146 --> 00:01:06,516
>> Chris Edelen: Okay.

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00:01:06,516 --> 00:01:07,456
Yeah, and that's right.

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00:01:07,456 --> 00:01:10,446
We've -- we're on track to
set a record for total number

30
00:01:10,566 --> 00:01:13,136
of utilization hours,
and that's NASA speak

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00:01:13,136 --> 00:01:15,376
for scientific experiments
and research.

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00:01:15,696 --> 00:01:16,026
>> Josh Byerly: Right.

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00:01:16,026 --> 00:01:19,076
>> Chris Edelen: And we also
set a record for one time hours

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00:01:19,306 --> 00:01:22,926
in a specific week; so that
really shows how the station

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00:01:22,926 --> 00:01:26,546
program is maturing and we're
reaching the point we've gone

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00:01:26,546 --> 00:01:30,136
from a focus on assembly
operations now to utilizations

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00:01:30,136 --> 00:01:33,446
so that the taxpayers get a
return on their investment

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00:01:33,446 --> 00:01:35,766
for the -- for the cost
of building station.

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00:01:36,076 --> 00:01:39,426
So again, we're -- we're
learning how to more effectively

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00:01:39,426 --> 00:01:41,776
and efficiently operate the
station's systems to free

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00:01:41,776 --> 00:01:43,136
up more time for research.

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00:01:43,486 --> 00:01:45,716
I'll give you a couple

specific examples

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00:01:45,716 --> 00:01:48,116
of some exciting
experiments that are going on,

44
00:01:48,166 --> 00:01:49,436
onboard the station right now.

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00:01:49,746 --> 00:01:52,166
One of them is called
CSLM, that's Coarsening

46
00:01:52,166 --> 00:01:55,986
of Solid Liquid Mixtures; and
that's an experiment that flew

47
00:01:55,986 --> 00:01:58,246
up on the Spacex Dragon.

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00:01:58,446 --> 00:02:02,236
And here you can see Chris
Hatfield working on CSLM

49
00:02:02,286 --> 00:02:05,166
in the microgravity
science glove box.

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00:02:05,166 --> 00:02:07,716
This is -- this is a
material science experiment

51
00:02:08,056 --> 00:02:12,846
that examines how
molten metals solidify,

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00:02:13,126 --> 00:02:17,066
and in the solidification
process and dendrites are formed

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00:02:17,066 --> 00:02:19,526
in the coarsening
of the minerals.

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00:02:19,856 --> 00:02:22,916
And the dendrites are -- they're
little tree-shaped structures,

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00:02:22,916 --> 00:02:26,186
microscopic structures in the
crystal; and they affect the --

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00:02:26,186 --> 00:02:28,866
the physical properties,
the strength

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00:02:29,176 --> 00:02:30,506
and the density of the material.

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00:02:31,206 --> 00:02:35,306
So on Earth it's -- there are
various processes at play,

59
00:02:35,596 --> 00:02:38,606
such as sedimentation
and convection;

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00:02:38,606 --> 00:02:41,716
but we can eliminate those
effects by, you know,

61
00:02:42,066 --> 00:02:44,046
casting this metal on orbit.

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00:02:44,046 --> 00:02:47,036
So that -- that's the
goal of CSLM is to --

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00:02:47,386 --> 00:02:53,166

to do the casting without those
interfering effects of gravity,

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00:02:53,476 --> 00:02:55,706
and then take the -- the
resulting materials back

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00:02:55,706 --> 00:02:56,926
to Earth and examine them

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00:02:56,926 --> 00:02:59,316
so that we can better
understand how to --

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00:02:59,316 --> 00:03:04,896
how to make metals such as
engine blocks or turbine blades.

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00:03:04,896 --> 00:03:06,986
If we better understand
the physical processes

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00:03:07,316 --> 00:03:09,756
of coarsening, we can
build better materials.

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00:03:09,806 --> 00:03:11,176
>> Josh Byerly: There's some
fish onboard too, aren't there?

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00:03:11,636 --> 00:03:12,296
>> Chris Edelen: That's right.

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00:03:12,296 --> 00:03:17,796
We flew up 32 Medaka fish on
the 32S Soyuz back in October

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00:03:17,796 --> 00:03:20,676
with -- with the crew,
and they were living

74
00:03:20,676 --> 00:03:23,836
in the aquatic habitat
facility in the Japanese module.

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00:03:23,836 --> 00:03:24,816
>> Josh Byerly: Which
is like an aquarium.

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00:03:24,936 --> 00:03:25,536
>> Chris Edelen: That's right.

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00:03:25,536 --> 00:03:27,986
It's a high-tech space aquarium,

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00:03:28,366 --> 00:03:30,806
and so this is a
Japanese experiment.

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00:03:30,846 --> 00:03:34,826
The -- it's -- the acronym is
most for Medaka osteoclast.

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00:03:35,106 --> 00:03:36,976
And the purpose of
the experiment is

81
00:03:36,976 --> 00:03:43,676
to study how the bones are built
and destroyed in zero gravity

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00:03:43,676 --> 00:03:45,166
without the effects
of Earth's gravity.

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00:03:45,516 --> 00:03:49,716
The osteoclast control the
building up process of bones,

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00:03:49,986 --> 00:03:54,416
and so -- so by studying
this in 0G,

85
00:03:54,416 --> 00:03:56,866
we can better understand
what genes and --

86
00:03:57,086 --> 00:04:00,436
are at work in the production
and destruction of bones

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00:04:00,766 --> 00:04:03,206
and how removing
gravity can effect that.

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00:04:03,486 --> 00:04:05,546
And, of course, we want
to understand these things

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00:04:05,546 --> 00:04:08,226
so that -- so that we can keep
our crews healthy during long

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00:04:08,226 --> 00:04:09,216
duration space flight.

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00:04:09,596 --> 00:04:12,816
But there's all kinds of
benefits and applicability

92
00:04:12,816 --> 00:04:15,466
to Earth for people
with osteoporosis

93
00:04:15,466 --> 00:04:16,676
and other bone diseases

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00:04:16,676 --> 00:04:19,006
to better understand

the basic processes

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00:04:19,006 --> 00:04:21,576
of how osteoclasts
and osteoblasts work.

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00:04:21,576 --> 00:04:22,246
>> Josh Byerly: So
why don't we look

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00:04:22,246 --> 00:04:25,246
at the five months you've been
the lead fly director for 34.

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00:04:25,246 --> 00:04:25,866
Has it been busy?

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00:04:25,866 --> 00:04:28,386
Has it been -- I mean, has
it gone by pretty quickly?

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00:04:28,386 --> 00:04:29,946
How has it been?

101
00:04:30,226 --> 00:04:31,486
>> Chris Edelen: It's
gone by more quickly

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00:04:31,486 --> 00:04:32,256
than I thought it would.

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00:04:32,256 --> 00:04:32,323
>> Josh Byerly: [laughter]

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00:04:32,323 --> 00:04:32,916
>> Chris Edelen: And, in fact,

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00:04:32,916 --> 00:04:35,856
the crew has said the same

thing, that each week seems

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00:04:35,856 --> 00:04:38,326
like about a day
because it just flies by.

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00:04:38,326 --> 00:04:42,096
They're very busy onboard, but
things have gone very smoothly.

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00:04:42,096 --> 00:04:44,876
We've been able to accomplish
all the research objectives

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00:04:44,876 --> 00:04:45,726
that we wanted to.

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00:04:46,126 --> 00:04:50,316
We've had a total of 166
experiments on this increment,

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00:04:50,316 --> 00:04:52,586
with over 400 principle
investigators.

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00:04:52,586 --> 00:04:52,666
>> Josh Byerly: Wow.

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00:04:52,666 --> 00:04:55,456
>> Chris Edelen: So we've gotten
a lot of good science done; and,

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00:04:55,456 --> 00:04:57,736
again, that was the
primary goal;

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00:04:57,736 --> 00:05:00,386
and so it's very gratifying
to have completed that.

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00:05:00,586 --> 00:05:01,796
>> Josh Byerly: So
last question for you.

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00:05:01,796 --> 00:05:03,536
You know, as you look
back on the five months

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00:05:03,536 --> 00:05:05,076
that you spent working on
this unit, what's been sort

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00:05:05,076 --> 00:05:07,486
of the biggest -- what do you
think is the biggest thing

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00:05:07,486 --> 00:05:09,896
that you're proud of -- most
proud of; and then what's been,

121
00:05:09,896 --> 00:05:11,056
like, the biggest
surprise you've had?

122
00:05:11,866 --> 00:05:12,146
>> Chris Edelen: Okay.

123
00:05:12,146 --> 00:05:14,476
Well, the thing I'm most
proud of is my team.

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00:05:14,606 --> 00:05:14,746
>> Josh Byerly: Yeah.

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00:05:14,816 --> 00:05:16,856
>> Chris Edelen: Not
only the guys on orbit

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00:05:16,856 --> 00:05:18,576

that have done just great work,

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00:05:18,616 --> 00:05:20,526
but the people here
to the ground.

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00:05:20,526 --> 00:05:23,136
As Increment Lead Flight
Director, I've been privileged

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00:05:23,136 --> 00:05:25,846
to work with a team of
lead flight controllers,

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00:05:25,846 --> 00:05:27,436
some of which are here
in Mission Control,

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00:05:27,826 --> 00:05:31,676
others are in Palla's
Operation Center in Huntsville,

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00:05:31,936 --> 00:05:34,286
and the other international
partner control centers

133
00:05:34,286 --> 00:05:34,946
around the world.

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00:05:34,946 --> 00:05:37,716
So that's been -- that's been
the most gratifying part is just

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00:05:37,716 --> 00:05:40,896
being part of just an excellent
team that has the same vision

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00:05:40,896 --> 00:05:44,246
to advance the calls of
human space exploration.

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00:05:44,706 --> 00:05:44,946
>> Josh Byerly: Yeah.

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00:05:44,946 --> 00:05:46,046
Well, Chris, thank
you for your time.

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00:05:46,046 --> 00:05:47,906
You know, if you want to
learn more about everything

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00:05:47,906 --> 00:05:50,026
that Expedition 34 has
worked on, you can also log

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00:05:50,026 --> 00:05:55,106
on to the NASA website at
www.nasa.gov slash station.

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00:05:55,656 --> 00:05:59,916
Take a look at Ford and
Tarelkin and Novitskiy,

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00:06:00,006 --> 00:06:03,106
and also take a look at what's
ahead for the crew that's coming

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00:06:03,106 --> 00:06:03,956
up at the end of the month

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00:06:03,956 --> 00:06:05,876
that will join Expedition
35 in progress.

146
00:06:05,876 --> 00:06:08,216
Of course, they've got a ton
of science going on as well.