good morning everybody and welcome to

the Johnson Space Center we're here
today for our expedition 43 and the
one-year crew mission overview and
science briefing I'm Dan Huot so we're
just about two months away now from the
launch of nasa astronaut scott kelly and
russian cosmonauts mikhail kornienko and
gennady padalka kelly and kornienko will
be spending a full year onboard the
station very important milestone and a
new step as we begin our next journeys
getting ready to make giant leaps beyond
and eventually on to Mars so we're going
to talk a little bit about what's ahead

for the crew for the next year joining

me here today I have international space

station program manager Mike suffered

Deenie i also have emily nelson nasa

flight director Julie Robinson the

international space station chief

scientist finally Steve Gilmore NASA

flight surgeon so we're going to hear

from each of them first and then we'll

go ahead and open it up for everybody's

questions so Mike why don't you go ahead

and start us off well good morning it's

been quite a while since we announced
that we were going to have a one-year increment on board and so it's good to be in front of all of you discussing it today specifically several years two or three years ago we sat down with our partners and decided it was time to start considering extending our durations onboard ISS in order to start to understand the effects of microgravity and other environments in space on the human system as we start to approach exploration beyond low Earth orbit and at that time we picked this
period to begin our first one year

44 00:01:42,688 -- 00:01:49,139
increment and the team has been

45 00:01:45,750 -- 00:01:51,149
preparing for this ever since as luck

46 00:01:49,140 -- 00:01:53,250
would have it of course we also have

47 00:01:51,149 -- 00:01:56,519
another number of other things going on

48 00:01:53,250 -- 00:01:58,379
board stations so during these four

49 00:01:56,519 -- 00:02:03,390
increments that will make up the one

50 00:01:58,379 -- 00:02:07,078
year flight for both Scott and Misha

51 00:02:03,390 -- 00:02:09,750
we're also going to be reconfiguring the

52 00:02:07,078 -- 00:02:12,639
u.s. segment to have dockings again and

53 00:02:09,750 -- 00:02:15,280
in preparation for the arrival of

54 00:02:12,639 -- 00:02:17,679
the first commercial crew vehicle to the

55 00:02:15,280 -- 00:02:20,409
International Space Station so this

56 00:02:17,680 -- 00:02:22,959
period will be will be not only busy

57 00:02:20,409 -- 00:02:25,299
from a research standpoint as we do the
research that we have been doing for some time on the human subjects for six months but we have the one-year subjects as well that adds to our list of research to do and of course the ever growing commercial use of the International Space Station is also picking up during this period of time and so in the middle of all this research we have major reconfiguration of the International Space Station as we begin to adapt the forward port on know to to have a new docking system the NASA docking system we call it and an adapter
that we're going to have on station

the international docking adapter so

we'll have one on the forward port and

then we'll put one on the zenith port of

no.2 and we will clear the nadir port of

node one to have the backup birthing

port so when we're done we have docking

on the forward port will have docking on

the zenith port and we'll have birthing

on the note to nadir port and the node

one nadir port of course today we have

the pmm unknown one nadir and so we have

a quite a fit quite a bit of work to do

to move the pmm to run all the cables we
need to run for the new docking systems

to prep for the movable of p.m. a three

from node three a port 22 no to Zenith

and then of course the installation of

the docking adapters which today are

planned be brought up on SpaceX seven in

space X 9 so all of this work is going

on while the one your cruise on orbit so

we we will keep them very busy which i

think is a good thing as you're spending

quite a bit of time on orbit but at the

same time getting ourselves ready for

the first commercial flights to the

International Space Station so what the
in addition that i should say in this

00:04:26.420 --> 00:04:31.100
that we've been working with the

00:04:28.879 --> 00:04:34.519
logistics partners to get the vehicle

00:04:31.100 --> 00:04:37.820
squared away to support ISS for the next

00:04:34.519 --> 00:04:39.589
year or so our orbital friends will

00:04:37.819 --> 00:04:43.159
start flying back to station hopefully

00:04:39.589 --> 00:04:45.199
in the October of 2015 timeframe the

00:04:43.160 --> 00:04:47.360
SpaceX corporation course had their

00:04:45.199 --> 00:04:48.949
first successful launch of the year to

00:04:47.360 --> 00:04:51.800
the International Space Station dragon

00:04:48.949 --> 00:04:55.490
is they're servicing it now and we have

00:04:51.800 --> 00:04:57.379
flights lined up for april and the

00:04:55.490 --> 00:04:59.500
june/july time frame and then one at the

00:04:57.379 --> 00:05:01.819
end of fall and we're looking to pull up

00:04:59.500 --> 00:05:03.949
the flight and december up into the
November time frame in order to keep the logistics train going so that looks very good for the program in addition to that we also have an HTV flight in the summertime so from a logistics standpoint in order to pet support the research that we plan to do both the nominal research we have and the one-year increment we it looks like the logistics will support all that so that's the plan going forward this morning Emily will walk through the ops portion of that and then Julie will give you quite a bit of rundown on the
research aspect of as well so with that

all handed over to Emily good morning

first let me walk through for you the

crews that will have making up the

expedition's of this year long flight

over the course of the year and Scott

and Mikhail will be a part of four

separate expeditions we can start

bringing up those graphics will begin

with terry virts samantha Christopher

Eddie and anton shkaplerov that are

already on orbit today Scott and Mikhail

and gennady padalka will be joining them

to make up the expedition 43 crew when
Terry Samantha and Anton depart shortly thereafter will move into expedition 44 with the mission of Kelly Lindgren. Kimiya Yui and Oleg Kononenko will be joining them to make up expedition 44 in order to provide a fresh so use for Kelly Kornienko and Padalka will be having a direct hand over for the trade from expedition 40 42 45 so Volkov will bring up a Soyuz that will include ESA astronaut Andre's Morganson and spaceflight participants are participants Sarah Brightman then Sergei will stay onboard trading places with.
Gennady Gennady will take Andreas and Sarah Brightman back home again and that will make up your Expedition 45 crew.

Then once they and Kimia and Oleg depart, Tim Kopra, Tim Peake, and Yuri Malenchenko will come up for Expedition 46 and that will make up the four separate expeditions that will have over the course of the year.

Again, as Mike pointed out, over the long duration of this mission, we're going to do quite a bit of not only research but also systems reconfigurations to make room for docking adapters so that we can start bringing up our crude.
vehicles in order to get those international docking adapters installed

we've got some graphics to show you the reconfigurations that mike outlined here

you can see the permanent multi-purpose module and where it will be moving from

the blue location where it is nadir of

the node one module out to the forward port of the node three module freeing up that node one port for cargo vehicles

will also continue to berth cargo vehicles at the node to nadir port so

they'll be side by side there then we also need to move pressurized mating
adapter number three again starting in

its location at the pork side of node 3

where shown in blue and the graphic

moving it to the zenith portion of node

2 so that our two docking adapters can

be side by side they're on the zenith

and forward portions of node 2 you can

see the white tips of the pressurized

mating adapters are the international

docking adapters all of that work

requires a great number of spacewalk

activities and currently that spread

across seven different space walks over

the next year one of those is complete
we've got three more coming up soon and

a briefing about those next month we

also have a significant structural

science opportunity with the Bigelow

expandable Activity module coming up on

a SpaceX mission this summer that will

be installed on the nose

3 aft port we have a quick video showing

the extraction from the SpaceX vehicle

and then the u.s. robotic arm is going
to swing that around to install it on

the three it brings with it the gas

canisters required for its expansion so

once we get it installed robotically

will then be able to ingress that module

and deploy the gas from its canisters

and here you'll see a wait for the video

eventually there we go and then it'll be

our first soft-sided expandable module

it'll be on board for a total of two

years periodically the crew will go

inside to gather data on structural

integrity leak rate temperature

radiation environment and all of those

kinds of information which will pass

back to our big low partners as we

progress in new structural technologies

for future space flight and with that we

will be doing quite a bit of science
over the course of the year and Julie

will walk through a lot of that force

thanks Emily you know we have hundreds

and hundreds of Investigations going on

over the coming year really probably

between 400 and 500 investigations will

take place we don't even know how many

investigations because we're doing such

a rapid turnaround especially with

commercial users getting to ISS that

there are users who will come to ISS this year who have not yet finished

designing their experiment so it's a

really exciting dynamic time for the
laboratory but if I were going to pick a single theme it's clearly health for exploration and health for life on Earth and so I want to talk to you I just picked six investigations that really help you understand that context of how the research that we're doing on ISS both helps us make sure that crews will be healthy and ready to go to Mars when we have the systems ready to support that as well as take that knowledge and bring it back here on earth to make people's lives better help them live longer and help them live with a higher
quality of life so the first area is

really working at the almost the cellular level at a basic building block

level and using space to understand how cells respond to gravity and then hoping to then use that to interpret health on earth so if I could have my first graphic I want to explain a little bit of the basics of why we do this in space so if you look at those three little flasks they represent three of the things that don't happen in space that happen on earth that really matter for cells in the upper left one of the
things you don't have is convection so

you don't have mixing warm things don't rise cold things don't fall on the flask

on the right what you see is we have a low shear environment there's not a lot of waves and mixing that like you have in a gravitational environment when you're growing cells and at the bottom you see the the third flask shows that we don't have sedimentation in space so heavy particles don't go to the bottom of a fluid like they do here on earth and those three things dramatically change the way that you culture cells and how those cells respond in fact it
makes the cells act more like cells in the body and less like cells in a test tube and and then the graphic also represents three kind of big picture views of how cells change in space at the top you see that they change their shape they go to be a sphere if they can and at all and just like the water bubbles that you see astronauts drinking go to a perfect sphere in the lower left in the blue you see that they change the way they talk to each other so those particles where they signal to one another change and then on the right you
see another major change which is all

the genes that turn on and turn off

change as those cells respond to this

environment and this gives an incredible

experimental platform for understanding

how gravity plays a role in in cells so

as an example then of some of the ways

that we use this the National Institutes

of Health partnered with cases the

Center for the Advancement of science

and space which manages our national

laboratory have two investigations that

will be flying this year completely

focused on improving our understanding
of osteoporosis and bone loss back here

on earth one of those is called NIH

osteoporosis and bone loss back here

on earth one of those is called NIH

and cells that rebuild bone because your

imbalance in those cells is what causes

astronauts to lose bone in space it's

also what causes women with osteoporosis

and some men with osteoporosis to get

out of balance and start losing bone and

this nih-funded investigation will be

helping to understand the actual genes

that are turning on and turning off

helping to understand the actual genes

that are turning on and turning off
controlling the activity of these cells

00:13:33,589 --> 00:13:37,700
doctorate is very important to understanding

00:13:35,450 --> 00:13:40,310
how to manage osteoporosis on earth

00:13:37,700 --> 00:13:43,040
another nih-funded investigation with

00:13:40,309 --> 00:13:44,929
cases is called osteo 4 and this is

00:13:43,039 --> 00:13:47,569
looking at the cells in the bone that

00:13:44,929 --> 00:13:49,699
actually scents mechanical forces so

00:13:47,570 --> 00:13:51,860
your bones are sensing the forces on

00:13:49,700 --> 00:13:53,360
your body both from exercising from

00:13:51,860 --> 00:13:55,159
standing and fighting gravity all of

00:13:53,360 --> 00:13:56,750
those forces and this study will be

00:13:55,159 --> 00:13:58,370
looking at those cells that actually do

00:13:56,750 --> 00:14:00,649
the sensing right now scientists do not

00:13:58,370 --> 00:14:02,509
understand how those cells get their

00:14:00,649 --> 00:14:04,850
signal and communicate it to the other
cells and so osteo for we'll be looking at that process and finally it's one more example there are a number of stem cell studies that will be flying in the coming year cases when did a stem cell call they had the largest response to any call for independently funded research on the space station that they've made to date with hundreds of applicants and some of their first studies from that call will be flying and there will be a number of different stem cell studies one of those just as an example is a Japanese study called
stem cells that takes mouse stem cells

it flies them in space for a period of

time then they bring them back home they

insert them into a mouse embryo an

eight-cell mouse embryo back on earth

and then look at how the development of

that embryo occurs over time so this is

really getting at understanding the

basics of stem cells turn and

developmental biology which is a really

interesting area as medicine tries to

move towards helping people to rebuild

their own organs when they have injuries

shifting then from that small cellular
level up to the level of the whole human

the one-year expedition as well as the

six-month crew members in the coming

year are also really important so this

will be the first time that we've had

astronauts on the space station for 12

months it will also be the first time

since the 1990s that we've had anyone in

space for 12 months or more and you know

since the late 1990s I think about all

the changes in medicine that have

happened they've been major changes in

our understanding of human physiology

also in him human physiology in space
all the things that we've learned from

00:15:36,700 --> 00:15:40,390
the space station weren't known at that

00:15:38,080 --> 00:15:42,190
time and we've got a genetic

00:15:40,389 --> 00:15:44,049
understanding of disease that is

00:15:42,190 --> 00:15:45,880
completely new from when the last

00:15:44,049 --> 00:15:48,819
cosmonauts flew for long periods of time

00:15:45,879 --> 00:15:51,129
in the 1990's and that genetic

00:15:48,820 --> 00:15:52,839
connection understanding how genes and

00:15:51,129 --> 00:15:54,250
environment interact especially if that

00:15:52,839 --> 00:15:56,710
environment is something like being in

00:15:54,250 --> 00:15:58,750
space is something completely new in the

00:15:56,710 --> 00:16:00,250
one-year expedition and we have a unique

00:15:58,750 --> 00:16:02,259
opportunity that we're taking advantage

00:16:00,250 --> 00:16:04,149
of not only will we have a number of

00:16:02,259 --> 00:16:06,939
measures taken jointly on both scott
kelly and victor Kornienko but Scott has a twin brother Mark Kelly and so mark will participate as a sort of a ground control to really help us understand this nature versus nurture question and a group of 10 really premier scientists at looking at the genetic basis of disease and the genetic basis of many of the different processes that affect astronauts have partnered in this twin study to really make it a state-of-the-art investigation of that interaction between genes and the space environment in affecting the health of
astronauts for if I could have the next graphic for the past 15 years we have really learned a lot about long-duration spaceflight we've learned about the neurological system the heart bone muscle the immune system nutrition effects behavioral effects and radiation effects and all of those things kind of really affect the bodies of astronauts and they they push them towards something that looks not at all unlike aging on earth where their balance is disrupted their hearts are weaker their immune system isn't functioning as well
their muscles are weaker and their bones are being lost and yet these are healthy people who otherwise would be probably some of the healthiest people back here on earth for their age and so we care about this both for future exploration but also because of these potential earth benefits from doing the research with the crew now we know a lot about six months but we know almost nothing about what happens between six and twelve months in space and if I could have the next graphic this is a highly simplified chart to kind of show you
what we know about those effects on the

00:17:40,869 --> 00:17:45,069
body in from zero to six months and

00:17:43,240 --> 00:17:46,450
which is that vertical line in the

00:17:45,069 --> 00:17:47,230
middle and then from six to twelve

00:17:46,450 --> 00:17:48,880
months afterwards

00:17:47,230 --> 00:17:50,860
right now we know nothing about six to

00:17:48,880 --> 00:17:52,540
12 months so we see some things that

00:17:50,859 --> 00:17:54,189
have an early effect and then sort of

00:17:52,539 --> 00:17:56,079
stabilize we see some things with a

00:17:54,190 --> 00:17:58,029
constant rate either a high rate or a

00:17:56,079 --> 00:17:59,678
low rate and we understand how to manage

00:17:58,029 --> 00:18:01,960
those risks and we know which ones we

00:17:59,679 --> 00:18:04,419
need to work on before will be go for

00:18:01,960 --> 00:18:06,490
Mars but what we don't know is if there

00:18:04,419 --> 00:18:09,100
are some some processes that have a late
effect the yellow line in that in that
cart that late effect has things going
up after six months but not looking like
a problem before that and so this
mission even though it's only two crew
members it really gives us our first
glimpse at what happens from six to
twelve months and what risks are there
that we don't know about today and then
that will help us both to design future
research too and also to identify those
risks and then to define the future when
your expeditions that we may need to do
to make sure those risks have been taken
care of and we're ready to go to Mars a

couple examples of investigations that

will be doing one investigation will be

doing is called well two investigations

really fluid shifts and ocular health

and if I could have the video I have

some graphics that kind of illustrate

that problem so when astronauts go into

space this is a person on earth where

gravity is pulling the fluids in your

body down towards your feet and you have

that normal fluid movement at normal

circulation but when astronauts go into

space they don't have gravity pulling
the fluids down anymore and so you start

going a shift of fluids to the head

the crew members that we know well we see their faces looking puffy and we see

their legs looking skinny and chicken

legs we call it well once you get those fluids shifting into the head this is not without some impact and we've learned this over just the last couple of years that you also get an increase in the pressure in your brain called the intracranial pressure and that fluid pressure pushes on the back of the eye causes swelling of the optic nerve and
compresses the eyeball well as you can

500
00:19:39,579 --> 00:19:43,808
imagine the eyeball is a really

501
00:19:41,919 --> 00:19:45,400
sophisticated imaging device and when

502
00:19:43,808 --> 00:19:48,279
you compress it you're going to start

503
00:19:45,400 --> 00:19:52,059
going impacts on vision and so we see

504
00:19:48,279 --> 00:19:54,009
things like up to a 1.75 diopter shift

505
00:19:52,058 --> 00:19:55,750
in vision and that's simulated there

506
00:19:54,009 --> 00:19:58,240
it's basically high-powered reading

507
00:19:55,750 --> 00:19:58,869
glasses we also a few crew members have

508
00:19:58,240 --> 00:20:00,759
had things like

509
00:19:58,869 --> 00:20:02,289
cotton wool spots where certain parts of

510
00:20:00,759 --> 00:20:04,450
their retina have been damaged and they

511
00:20:02,289 --> 00:20:06,549
can't see as well there it but it

512
00:20:04,450 --> 00:20:09,220
doesn't happen to everybody and so the

513
00:20:06,549 --> 00:20:11,109
vision ocular health study is really
taking measurements to understand why it's happening in crew members what the measurements are changing and you saw Karen Nyberg they're having a measurement taken on her I we also have a study to start understanding the real thing that's happening as the fluids move up and down in the body and this will be the most complicated experiment we've ever done on ISS and even more than that we'll be doing it with a combination of us and Russian equipment in the Russian segment with both Russian cosmonauts and astronauts participating
as subjects and helping to set up and
operate the experiment so it's gonna be
a really exciting investigation we will
use the Russian chivis which is a lower
body negative pressure device to
actually suck the fluids down into the
crew members legs and then use our
ultrasound and other equipment to make
measurements on them and see what's
happening with their blood vessels when
what's happening with the fluid shifts
so this is going to be a really novel
investigation and give us some insights
we've never had before into this overall
fluid shift and impact problem

another investigation that's part of the one your increment is called field test

and this is not done on ISS but it's done on the ground in Kazakhstan after the crew members returned and it's looking at the practical tasks that astronauts would have to do after a transit to Mars things they would have to do right away when they land on Mars so you know right now when we land in Kazakhstan we've got a whole support network of people to help support the crew members but that first crew going
to Mars is going to be all by themselves

and so if I could have the next video

I'll show you just some examples of the

kinds of tasks one thing that crew

members would have to do is get out of

their seats or get out of the

protection that they've been in for

pretty rough landing and they'll have to

be able to jump out of a vehicle perhaps

you know jumping down some stairs they

might need to move some things around we

call that rock translation with these

different different barbells and so as

you can imagine when crew members come

back they have dizziness they have what
we call orthostatic intolerance

which means a tendency to want to faint

because they're not used to having

fluids back up back down in their feet

and out of their head and here's some

construction activities you might need

to connect some valves together have

everything ready to go to protect your

life support system you're screwing

things together bolting things together

connecting tubes and using some tools

and that crew members may have to do

this when they're relatively dizzy

possibly not feeling well their muscles
may be weakened their bones maybe

weekend they've just been on a transit

in a very small compartment before they

start doing these things they may need

to open hatches and so you can see a
torque generation activity and other

things that the crew members will have
to do while their whole sensory system

adjusts to being in three-fifths gravity

wearing heavy suits and really doing

things quite differently and the final

one I want to show you was a ladder

climb test where the crews might need to

climb into a vehicle or out of a vehicle
or into a habitat so this is helping us
and it's done completely jointly with
our Russian colleagues and these are
only a few of the types of measures that
are made it's this is helping us to
really work internationally to
understand how the crew members could
carry out the tests that need to be done
on Mars and it really helps us prepare
for a joint investigation but also if
you look at these tasks these kinds of
tasks are things that patients on earth
who have say had a stroke or recovering
from some kind of injury also need to do
we see patients in occupational therapy so what we learned from this is in someone who hasn't had a brain injury how can we retrain people who've lost the ability to do some of these things to do them well and are there things we can do even in the transit as we go to Mars to help prevent some of these impacts so even though we're focused on exploration in defining some of these tasks they also really benefit us back here on earth so just to wrap up we'll have between 400-500 investigations on ISS in the coming year about 380 six-month period and many joint
investigations with our Russian colleagues a level of collaboration across the whole ISS partnership of all 16 nations that is higher than we've ever seen before and we're of course also having the astrophysics the physical sciences all kinds of things that I didn't talk about today but i think this theme on human health both of crews and of health back here on earth is a really important one and now hand it off to Steve to tell you a little bit about the health of the actual crew thank you appreciate the opportunity to
talk this morning and I would add to my colleagues comments about the importance of this mission it'll provide us critical experience for planned future operations so that hopefully one day we can ask a crew member to stay for two years in space for three years in space depending on what the missions call for from the medical perspective the crew we start being involved with the crew about two years prior to their launch and I had some activities with Scott earlier this morning and I think nobody's happier than the crew to find out that
they only have he only has like five

activities left before he launches when

you look at the total program of that

two-year time period there's about 40

hours of the equivalent of 40 hours of

testing that we do and any body system

you could think of we we have testing

that we are interested in doing for that

and so we have a few more activities

before before launch and then as the

science program will we'll be

maintaining a comprehensive set of

investigations during the flight to have

a sense for how Scott's doing how his

before before launch and then as the
body systems are changing and eventually

671
00:26:00,430 --> 00:26:08,680
his preparedness for return to Earth and

672
00:26:06,210 --> 00:26:10,900
the additional comment I would make is

673
00:26:08,680 --> 00:26:13,029
as was talked about within the science

674
00:26:10,900 --> 00:26:15,900
program we have a unique opportunity on

675
00:26:13,029 --> 00:26:20,049
this mission because Scott has a twin to

676
00:26:15,900 --> 00:26:21,970
look very closely at the changes that

677
00:26:20,049 --> 00:26:24,609
the space environment provide while

678
00:26:21,970 --> 00:26:28,740
studying his brother who's staying on

679
00:26:24,609 --> 00:26:31,419
the ground while Scott's in space and I

680
00:26:28,740 --> 00:26:33,370
I don't have any other comments at this

681
00:26:31,420 --> 00:26:35,240
point the crew are doing well and

682
00:26:33,369 --> 00:26:38,299
looking forward to the mission and

683
00:26:35,240 --> 00:26:41,630
we're excited to be participating in

684
00:26:38,299 --> 00:26:42,889
this all right thanks Steve and thanks
for everybody for your opening

statements now time for questions we're

go to our phone bridge and then we'll

take some of our questions out of that

we're getting in from social media so

just like i read i'm going to go left to

right so if you would raise your hand

and again please state your name

affiliation Eric ok Eric burger with the

Houston Chronicle question for Mike and

then the question probably for Ben for

Julie some are suitable to your mission
obviously so they didn't space of it on

the ground do you have any plans or

would it be possible to an 18 year or

two year mission on the ISS we thought

about that or talk about that we have

not talked about it we certainly could

this is sort of a stepwise approach

there's a number of things you use

station for and this is one of them

courses to study the human adaptation to

a microgravity environment in the entire

environment that that space is relative

to living here on earth so I think the

first step of doing one year missions to
kind of see where that knee and the curve is like Julie talked about is very important and I think that's the way we'll handle it will look to see what happens in a year if we get indications that things are changing or were unstable and and we need to spend more time on orbit than I suspect that we'll have a conversation about extending that a little bit a little bit so from a station standpoint there's really no limitation we can we can have a limited set of the crews stay for extended period of time we could have the entire
crew stay for an extended period of time

00:28:18,609 --> 00:28:22,729
if we thought that was appropriate and

00:28:20,839 --> 00:28:26,750
this again the system doesn't really

00:28:22,730 --> 00:28:28,789
prevent that there's limitations on the

00:28:26,750 --> 00:28:32,269
transportation spacecraft for the crew

00:28:28,789 --> 00:28:34,339
that we'd have to replace every so often

00:28:32,269 --> 00:28:38,229
and we've done that in the past so

00:28:34,339 --> 00:28:39,859
that's not a big deal and it's just

00:28:35,569 --> 00:28:40,519
about having the logistics on orbit for

00:28:37,579 --> 00:28:43,308
the crew to perform so there really is

00:28:40,519 --> 00:28:45,169
to keep

00:28:43,308 --> 00:28:47,170
no limitation on the station to to keep

00:28:45,169 --> 00:28:48,550
us from extending the crews time even

00:28:47,170 --> 00:28:52,120
longer on orbit but we have not really

00:28:48,549 --> 00:28:54,399
discuss that with the partnership at

00:28:54,399 -->
this point kind of dated Roscosmos
collect in the 1990s on their one-year missions or their 438 day missions was it useful have you guys and they shared it with you as part of the partnership and in terms of sort of i mean we with the tools and sensors and computers will be able to get like ten times as much data are just sort of how much more useful is it going to be to sort of be doing this now versus what was collected maybe 15 or 20 years ago yeah so rest cosmos has shared both some of the unpublished data with us they've also published several volumes of data from
mirror that explained in the data that

they've observed in terms of deconditioning and so forth at the time

the standard would be making fairly observational measurements about you

know how well the crew was able to exercise how strong they were when they returned to earth so they're very basic

kinds of measures that are in in that data so they're useful but they're very basic and there's only a handful of data points or handful of crew members with that data so what we're seeing now is we're working with them to look at
everything we know from six months and

where we should go from there so for

either NASA nor Rose cosmos

knew back in those days that there would

be I impacts the the stuff I talked

about with vision has been discovered

just in the last three years only when

you had a large number of crew members

doing long-duration missions another

everyone is I think from mere data

because of the exercise hardware they

had we mostly thought and they're under

Russian colleagues mostly thought that

running on a treadmill was the most

important thing to do and it is

00:30:30,009 --> 00:30:33,609 certainly important for cardiovascular

00:30:31,769 --> 00:30:36,549 for maintaining your cardiovascular

00:30:33,609 --> 00:30:39,039 fitness but what we found on ISS is that

00:30:36,549 --> 00:30:41,079 intensive resistive exercise is what

00:30:39,039 --> 00:30:43,059 really helps to protect bone so all of

00:30:41,079 --> 00:30:45,399 that knowledge is going into these joint

00:30:43,059 --> 00:30:46,779 investigations I think they're about 15

00:30:45,400 --> 00:30:48,220 different investigations that we're

00:30:46,779 --> 00:30:51,309 collaborating with our Russian

00:30:48,220 --> 00:30:53,019 colleagues on exchanging data and even

00:30:51,309 --> 00:30:54,789 comparing investigations that we've been

00:30:53,019 --> 00:30:56,230 doing on six months with investigations

00:30:54,789 --> 00:30:58,269 they've been doing on six-month crew

00:30:56,230 --> 00:30:59,110 putting that all together with 12 months
of data and then able to compare six month versus 12

only have two crew members it makes it much more powerful when they do the same

investigations that we have really strong data on for many crew members in

six months see this dense forest even can you give us a sense of what Scott

Kelly will experience on a weekly based on what sort of data would you be clicking every day what stuff is every week or every month or how does that just a sense of what he's going to have
to do collected data that you guys

looking for it's it's a good question on

a weekly basis we Scott will have a

science program that's being implemented

and so those those activities typically

have to occur at identified times during

the flight the other things that he'll

do for us is we have a weekly medical

conference with them and just to kind of

get a sense for how he's doing in that

regard and many of our activities from

the medical system side are are

grounded towards a monthly monthly type

evaluation for example we would check
his exercise capacity that type of thing

the other thing that the crew are doing on a daily but they're there they're doing things on a daily basis to help maintain their health status and primarily that's the exercise system they have approximately two to two-and-a-half hours a day to do exercise and so we use we use a suite of activities to monitor the crew we do a little bit of telemedicine to kind of keep their status and then there's a lot of one of the things to as a follow-on to the previous question is we now have
on board in contrast to mirror we have a

lot more sophisticated imaging

 capability so we have ultrasounds

complicated gear to you know get very

detailed images of the back of the eyes

for examples and so those things will be

done on a regular basis so that we can

monitor

are the chain any changes throughout the

play is there any changes to his

predicted exercise regimen over a year

is it pretty much the same thing

throughout depending on how it goes um

the short answer is we're planning to do

something akin to what they would do
during a six-month mission so we the 
what the acers or the trainers recommend 
for the crew is they'll generally put 
them through a few plateaus basically so 
you pick them up and let them relax a little bit and pick them back up and let 
them relax a bit and you're trying to 
get them to their fitness level ideally 
try to get them to their fitness level at the time that they launched so hi 
Robert problem with collectspace.com 
with a question and follow-up for Mike 
the from a program perspective in terms 
of supporting a six-member crew on
station are there any significant differences to keeping two people the same few people on board for a full year versus swapping about six months is there any specific challenges for a 40 one-year mission really there's not the biggest challenge when you rotate crews differently is to sort out how you're going to do that and you can kind of see that on what we call the a line where we fly to Russians and one US crew member on the Soyuz of light and you can see about halfway through the one-year mission they're going to rotate the
Soyuz and rotate commanders so all that had to be worked out and now we end up with a taxi flight and there's the decisions on who's going to fly on that flight and how you're going to deal with the taxi crew members but the operation of the station the logistics the science all that is the you know it's the same thing we kind of do on a regular basis and Julie mentioned this is a peak for for joint operations between the United States we're going on the 15th anniversary of human continuous occupancy of the station there's been
cosmonauts and astronauts onboard all

00:35:12,519 --> 00:35:18,759
that time why was it why is it take

00:35:15,130 --> 00:35:22,210
until now to this mission to encourage

00:35:18,760 --> 00:35:25,240
increased joint cooperation on science

00:35:22,210 --> 00:35:27,820
activities on the station well as the

00:35:25,239 --> 00:35:29,769
excellent question so from a research

00:35:27,820 --> 00:35:32,710
perspective we have been collaborating

00:35:29,769 --> 00:35:35,079
with the partners for many many years

00:35:32,710 --> 00:35:39,010
even well before the International Space

00:35:35,079 --> 00:35:42,159
Station program and as such if you look

00:35:39,010 --> 00:35:45,089
across the rest of the partners other

00:35:42,159 --> 00:35:48,519
than Russians you'll see a fairly large

00:35:45,088 --> 00:35:50,559
collaboration in research a Russian

00:35:48,519 --> 00:35:53,050
colleagues came in later and so it's

00:35:50,559 --> 00:35:54,909
taken us some time to get familiar with
each other what we do what kind of work

how we handle research how we choose

research how we do our research on orbit

how do you share the research when

you're done and so it's taken up to

about this period we it's it's been a

it's been a slow methodical process of

trying to get comfortable enough with

what how each side does certain types of

research and how you might collaborate

till we've come to this point and

honestly kind of use it as a forcing

function to say okay this this is we

can't really have everybody using the
crews separately particularly when we

have two crew members one's Russian and

ones us crew member and the way we do

research today or often up into this

point is a lot of the Russian research

was done on Russian crew members a lot

of the US researchers done the US crew

members but now we only have two crew

members and we wanted to make sure that

they were treated as identically as

possible so we can all use two data

points instead of each of us use a

single data point and so that kind of

forced the whole system to collaborate
on this research and it really has set
the process is in place for us to do

future collaborations so it's been
beneficial for us of course is you can
imagine it takes time this has been a

you know two year process of

how when we collaborate it was a it was
a criteria to agreeing to do this that

since the two crew members were from
different countries we had to share the
data and we had to collaborate and so it

became our forcing function so after the

last over the last couple years we have

collaborated on this and started to work
towards other areas where we can

00:37:36,559 --> 00:37:43,190
collaborate and also fix the the

00:37:39,849 --> 00:37:44,750
processes the wrong word you know the

00:37:43,190 --> 00:37:46,970
best way to collaborate is that the

00:37:44,750 --> 00:37:48,440
early stages of selecting the researcher

00:37:46,969 --> 00:37:50,779
going to go do that's where you really

00:37:48,440 --> 00:37:52,909
figure out where the pis are and how

00:37:50,780 --> 00:37:55,070
they're going to work together and so

00:37:52,909 --> 00:37:57,559
this is the probably the most difficult

00:37:55,070 --> 00:38:00,320
step of collaborating on or truly

00:37:57,559 --> 00:38:01,579
collaborating on orbitz the way we do

00:38:00,320 --> 00:38:03,470
today with some of the other partners

00:38:01,579 --> 00:38:06,409
and so that's being looked at today

00:38:03,469 --> 00:38:08,059
because of what we've been through with

00:38:06,409 --> 00:38:09,769
this winning increment so I tell you it
takes time to really get to know each other enough to figure out how to collaborate and then it takes sort of a forcing function and so we're just we're in a different place with the Russian our Russian partners than we are with the with our European partners but now we're starting to get there thank you Mark Karev for addition we have a couple of questions Mike suffered a knee as I listened to the agenda of activities it seems very vicious for the next year as you said so how crucial is it that the commercial cargo
providers provide on time it's all my

specific for the logistics providers yes

opposed to the committee really I mean a

lot of people are involved on the ground

in space you've got to move stuff back

and forth I'm just trying to get a sense

of how crucial you perceive it to be

that that they can show up and bring

stuff back and all that other stuff that

makes it work well it's the logistics

guys are the key to us being able to do

what we do on orbit I mean it's

fundamentally that's the case so you can

talk about wind providers might show up
and if they slip a little bit you can

talk about which providers as we know

SpaceX brings back recoverable down mass

a significant amount of recoverable

condition down mass which is significant

so you could talk about whether that's

there or slipping or not but it's it's

just crucial we can't we can't operate

without the logistics Partners so with

the orbital stand down for a bit we had

we basically lost 2.4 2.3 metric tons of

cargo that we had planned for so now

we're adjusting for that which is we can

do that's not a huge issue because of


how we protect ourselves on orbit with

00:40:07,210 --> 00:40:12,820
the the gap that we protect for and then

00:40:10,900 --> 00:40:15,130
as I I mentioned when we talked about

00:40:12,820 --> 00:40:18,430
the SpaceX 5 we've made some adjustments

00:40:15,130 --> 00:40:20,588
in that manifest and we protecting

00:40:18,429 --> 00:40:22,750
really closer to four months gap on

00:40:20,588 --> 00:40:24,719
orbit instead of six so we've made some

00:40:22,750 --> 00:40:27,309
adjustments so it's not as big a deal

00:40:24,719 --> 00:40:28,899
from a research impact although it has

00:40:27,309 --> 00:40:31,150
and then we're trying to pull these

00:40:28,900 --> 00:40:33,099
other flights up we're doing all that

00:40:31,150 --> 00:40:34,720
because we need to do it that way in

00:40:33,099 --> 00:40:37,269
order to continue to have a robust

00:40:34,719 --> 00:40:39,309
research plan and to get all of the

00:40:37,269 --> 00:40:40,599
other things we need to get done of
course there's quite a bit of about mass

for the reconfiguration that we have to
go do that has to show up and it's not
all in orbit today some of it has to

come up here and in the next few months
to get the reconfiguration certainly the
the docking adapter itself has to come
up on SpaceX seven so you know that's
critical I mean we can't we can't live
without it
so we're working very closely with
SpaceX to fly as close to the times that
we have on our manifest today of course
they agree to the manifest but things
happen and you know there's a lot of other vehicles flying and so they're very attended to that and working very closely with us to try to keep their schedule they're looking at these flights later in the year to see how much we might be able to pull them up and then our job is to maintain the flexibility so that when they move a little bit it's not it's not a huge impact us but they do need to show up for sure and if they move to the right a little bit then we'll be okay if I could follow could you just touch on the
cooling and that's going at this point

um yeah since I spent most of my life yesterday on that I probably could touching a little bit the core similarly

does this 24 hours a day I just visit every so often when things get

interesting the so we've course it was not an ammonia leak we have recovered cooling inside and and reconfigured the systems largely they're all back up and running but there's a significant challenge when you bring up the ammonia system outside because you can freeze the heat exchangers there's water on one
side heat exchanger ammonia on the other

00:42:24,278 --> 00:42:32,588
so just the phase of the ammonia alone

00:42:29,460 --> 00:42:34,210
can put you in a case where you end up

00:42:32,588 --> 00:42:36,909
with bubbles and then you end up

00:42:34,210 --> 00:42:40,690
freezing water in the and the heat exchangers and so it's it's been an

00:42:36,909 --> 00:42:42,940
interesting experience for us since

00:42:40,690 --> 00:42:44,710
we've flown space stations we kind of

00:42:42,940 --> 00:42:46,809
learned how difficult this can be and

00:42:44,710 --> 00:42:49,449
how you protect for it so it takes time

00:42:46,809 --> 00:42:51,309
to get the conditions right on both

00:42:49,449 --> 00:42:53,348
sides of the heat exchanger each of the

00:42:51,309 --> 00:42:55,269
heat exchangers more than one to make

00:42:53,349 --> 00:42:57,460
sure that as we introduce ammonia if the

00:42:55,268 --> 00:42:58,838
ammonia is at the right temperature such
it won't freeze water on the other side

and you have to do that not only for the 41 heat exchanger you've got to do it

for all the heat exchangers in that loop

so we're not really pushed for time we got plenty of cooling on the a side

and the systems are doing fine so so

we've asked the team to be very methodical and and and bring the loops on when you're ready of course to add a little interest to our lives late

yesterday we had an MDM go down that gives us insight into the loop beat some of the systems we recovered that MDM and
it turned out it had an error counter on it that was counting up and we found I guess we got it recovered it was going fine and we noticed this morning the air counter now has started counting up again which means eventually it’s going to run into this ADA issue so that just to add interest the team is now calculating when the error counter will time out and then we’re trying to plan our ops around when the eight and the counter will time out so that we can recover the MDM so that was just it that’s just add interest so it’ll take
us a little bit of time and we're doing

that on purpose if the a side went down

we'd suddenly do it a lot quicker and

we've actually been working on this this

specific case for the last year to kind

of we kind of got sensitized to it last

time we went through a pump change out

so the team has done quite a bit of work

I would tell you we're just being

conservative to make sure that

everything is going to be fine and we

find the right conditions to to

introduce the ammonia and keep us from

freezing the heat exchangers so that's
where we are again at the a side went

1127 00:44:41,590 --> 00:44:44,620
down we could probably get the B side

1128 00:44:43,360 --> 00:44:46,630
back a little quicker than we're doing

1129 00:44:44,619 --> 00:44:49,659
now but we just want to be very very

1130 00:44:46,630 --> 00:44:51,309
careful since we have the time and sorry

1131 00:44:49,659 --> 00:44:52,719
Marco let's keep it to wanting to follow

1132 00:44:51,309 --> 00:44:55,210
up right now if we have time at the end

1133 00:44:52,719 --> 00:44:58,000
will come back for final questions Jim

1134 00:44:55,210 --> 00:45:00,280
thank you have them for Julia Jim Oberg

1135 00:44:58,000 --> 00:45:02,679
with spectrum magazine

1136 00:45:00,280 --> 00:45:05,080
you gave a good explanation of why 22

1137 00:45:02,679 --> 00:45:08,710
sample sets are good but Tanner better

1138 00:45:05,079 --> 00:45:11,500
and the answer would be a questionably

1139 00:45:08,710 --> 00:45:15,789
you've discussed future reflex eb of the

1140 00:45:11,500 --> 00:45:18,730
12 month but without the commitment is
there any preliminary planning an apron

ability hopes for when you would send

your second problem expedition ethically

we know that two isn't enough but what

we don't know right now is what that six

to twelve month period looks like so

we're really I you know we're talking

about it scientifically but we're not

really having deep discussions about it

until we have the first information from

the first two if we see something

dramatic that's going to change how

everybody looks at having additional one

year missions if we don't see anything
dramatic then that might be less important and until we know that with these first two subjects it doesn't really make sense to draw a line in the sand because you're looking for unknown unknowns which is true information what are you up to confrontation and measurement they making that you really don't know what you're going to see what kind of things are you looking at that so far given no indications but in your intuition here James intuition please expect or worry but what are some things that might happen that can get
speculation I'm not asking her predictions so we have a pretty clean list of all the different physiological systems that could be impacted and in we have the study the same types of studies that we've done with the six-month cruise we're doing with the one-year cruise to make sure we've checked kind of all those major systems then we have the support of the medical monitoring to go behind it so that if there that also would detect something that maybe we didn't have an experiment focused on and so between those two things some
measurements you know we don't know what

00:46:54,039 --> 00:46:57,670
the eye looks like between 6 and 12

00:46:55,750 --> 00:46:59,860
months at all so that is a

00:46:57,670 --> 00:47:01,420
completely novel measurement we don't

00:46:59,860 --> 00:47:03,550
know we've never put the ultrasound

00:47:01,420 --> 00:47:06,190
together with the chiba in this kind of

00:47:03,550 --> 00:47:07,690
way so we have no idea what those

00:47:06,190 --> 00:47:09,730
fluid shifts look like these are really

00:47:07,690 --> 00:47:11,500
novel observations and

00:47:09,730 --> 00:47:13,929
then probably the most important novel

00:47:11,500 --> 00:47:17,019
observation is we've never done genomic

00:47:13,929 --> 00:47:18,759
studies in humans on ISS so we've never

00:47:17,019 --> 00:47:21,159
done something like the twin study where

00:47:18,760 --> 00:47:24,100
we looked at you know where we sequence

00:47:21,159 --> 00:47:25,989
the genes of both Scott and Mark and
then we look at the gene expression we look at different markers so that it on ISS it just looks like blood sampling but what you do when you get those samples home is brand-new we've never had data like that before Jim again just one question for now and one follow-up hi I'm Stacey glaze man with Houston Community Newspapers a question for dr. Gilmore um when obviously the twin brothers are study with Mark Kelly being that control is he training alongside his brother with the same type of physical training to their in the same
condition the condition I don't believe
that they're following the same exercise
programs no but maybe Julie can speak a
little bit more they are going through
very similar data collection programs
for the payloads that are involved yeah
participating in the same exercise
regime doesn't really make sense because
they're you know a major part of the
exercise you're doing every day is just
fighting gravity to stand up and to sit
so that wasn't you know scientists don't
think that that's unnecessary kind of a
control of course mark is a fit person
and he intends to stay fit so he's going to continue the things that he does and Scott's going to do the prescriptions that he has as well as his ground research now any more questions here in the room yo Chris based education I know a lot of preparations are made for the astronauts when they're going up while they're there are there any new preparations that are being made for this one year vision upon his return probably the biggest difference on return are going to be some of these things like field
tests that I talked about that will be

00:49:09,590 --> 00:49:13,820
more extensive kinds of ground

00:49:12,349 --> 00:49:15,500
measurements of how they perform in

00:49:13,820 --> 00:49:17,780
those tasks so we've been doing

00:49:15,500 --> 00:49:19,940
something we call mini field tests for

00:49:17,780 --> 00:49:21,680
the last few six-month crew members to

00:49:19,940 --> 00:49:23,869
start getting used to doing those kinds

00:49:21,679 --> 00:49:26,029
of complex operations in the 10th in in

00:49:23,869 --> 00:49:27,949
the medical tent in Kazakhstan that was

00:49:26,030 --> 00:49:29,360
a pretty new innovation and we got

00:49:27,949 --> 00:49:31,339
started on that a little early to make

00:49:29,360 --> 00:49:32,840
sure we could do it but the one-year

00:49:31,340 --> 00:49:34,280
field test measurements are going to be

00:49:32,840 --> 00:49:36,650
more extensive than anything we've done

00:49:34,280 --> 00:49:38,240
with the six-month crew members the
other thing that we will be doing

because they're participating in these joint studies we have to do some pretty tricky things to make sure that all the ground measurements even if they're when they're no longer together are also taken in parallel so there's some things like that on the ground that will have to keep a good eye on so that the data post-flight is is equivalent for the two crew okay any more in here inside the room no okay we'll go ahead and go to our phone bridge then please wait until I call your name I'll start off with
Marion crane from space com hi thanks so much for taking my question I'm running this questions for uh for dr. Robinson um so is there any kind of science that doesn't involve human health or human physiology research that you're able to do during one-year mission the maybe you wouldn't be able to do during a six-month thank you yeah so other than the then the studies using the crew as subjects in one year everything else we could have done with six-month crew or one year crew so the only subtle difference is that we have Scott and and
00:50:48,320 --> 00:50:52,670
Victor up for a whole year so we don't

1284
00:50:50,960 --> 00:50:53,900
have to train them twice once they know

1285
00:50:52,670 --> 00:50:55,789
how to do something they can continue

1286
00:50:53,900 --> 00:50:56,809
doing it so actually I personally

1287
00:50:55,789 --> 00:50:58,309
predict especially

1288
00:50:56,809 --> 00:51:00,230
knowing folks like Scott really well

1289
00:50:58,309 --> 00:51:02,329
that they're going to be more efficient

1290
00:51:00,230 --> 00:51:03,949
at doing tasks as they get on through

1291
00:51:02,329 --> 00:51:06,650
you know we have some investigations

1292
00:51:03,949 --> 00:51:08,509
that require operations for the full

1293
00:51:06,650 --> 00:51:09,800
year and I have a feeling by the time

1294
00:51:08,510 --> 00:51:11,300
they're doing it a month eight or nine

1295
00:51:09,800 --> 00:51:13,070
they're going to be probably better than

1296
00:51:11,300 --> 00:51:14,390
any six-month crew member ever it was at

1297
00:51:13,070 --> 00:51:17,450
doing that task just because they'll

00:51:14,389 --> 00:51:19,489
have have repetition but but overall

00:51:17,449 --> 00:51:20,629
it's just the the duration of the one

00:51:19,489 --> 00:51:22,250
your crew really makes them value-based

00:51:20,630 --> 00:51:25,670
subjects that's the primary scientific

00:51:22,250 --> 00:51:27,170
difference okay thank you Marion let's

00:51:25,670 --> 00:51:30,680
go next to Marcia done with The

00:51:27,170 --> 00:51:33,110
Associated Press yes hi I'm wondering

00:51:30,679 --> 00:51:35,449
what personality traits excuse me what

00:51:33,110 --> 00:51:37,250
personality traits to spud Kelly bring

00:51:35,449 --> 00:51:39,500
to the one-year mission that makes him

00:51:37,250 --> 00:51:42,980
particularly well-suited for being on

00:51:39,500 --> 00:51:45,860
orbit an entire year and as you consider

00:51:42,980 --> 00:51:48,079
more when your cruise what's your take

00:51:45,860 --> 00:51:58,220
on what the ideal person might be for
such a long flight don't take a swipe at such a long flight don't take a swipe at
that I guess wonder one of the things
you know there's a lot of factors that
go into into the crew selection and I
think I think some of the things that
are that Scott exemplifies is he's
fairly adaptable and that's something
that's important you got to be able to
roll with whatever comes your way during
a during a longer mission like this and
the other thing I had the opportunity to
work with him during his previous
six-month mission and I think all of us
no Scott pretty well but one of the good
things that he does is he's fairly direct he's not bashful about telling you what they're talking about what what needs to be done to improve things and that's also a really valuable trait yeah our previous behavioral health studies have shown that you know you can have challenges in communication between the crew and the ground as the crew becomes stressed out and so one of the things with Scott is of course that he is very open he's very ready to say what he what he thinks and so forth and so he's probably less
likely to have that tendency not to communicate with the ground if he gets frustrated but what's in interesting is he'll also be participating he and Victor will both be participating again in a repeat of that study that had those results for six month crew members so we'll get the opportunity to understand from several different studies from a study looking at their reporting of how they're feeling and in whether they're having senses of isolation and confinement there'll be some studies on their performance over
time and then there'll be these studies

1355
00:53:33,710 --> 00:53:36,199
on the way that they interact with the

1356
00:53:35,059 --> 00:53:38,989
ground and all of those different

1357
00:53:36,199 --> 00:53:40,460
studies will come together to help us

1358
00:53:38,989 --> 00:53:43,789
get a better sense of that after his

1359
00:53:40,460 --> 00:53:47,889
flights over as well okay next up we

1360
00:53:43,789 --> 00:53:47,889
have a me Thompson Space Flight insider

1361
00:53:50,500 --> 00:53:54,039
Amy are you there

1362
00:53:59,268 --> 00:54:04,518
Amy you're very low can you speak up

1363
00:54:02,259 --> 00:54:07,278
actually my questions and answers thank

1364
00:54:04,518 --> 00:54:10,988
you okay we'll go ahead and move on then

1365
00:54:07,278 --> 00:54:13,219
next we have Carrie Sheridan with AFP

1366
00:54:10,989 --> 00:54:14,898
thank you my questions already been

1367
00:54:13,219 --> 00:54:17,059
answered too thanks all right we're not

1368
00:54:14,898 --> 00:54:18,798
going to mount them so finally on our
phone bridge we have Irene Klotz with

Reuters didn't say that exactly what is

that Louis that is it's going to be

ready to support Commercial Crew

vehicles for brilliant pets loads and

after winter wouldn't happen now

planning how to seven remember to the

yes I think I did so so Irene our plan

is to be able to allow a vehicle to dock

to the international space station by

the end of calendar year 2015 I'm sorry

yet 2015 the thought process is that the

the commercial providers will probably

bring at least a test vehicle to ISS and
the 2017 timeframe and we wanted some
time to make sure that we had the system
checked out ready to go so art we're
shooting for the end of 2015 at least to
have one port active and the comm system
ready to support all that so that's what
we're shooting for today the manifest
calls for the commercial vehicles to
start bringing increment cruise to the
International Space Station in 2018 and
at that point the the vehicle will bring
a fork crew member up when it comes so
that's the point which will step up to
one additional crew member on the
International Space Station okay that

will do it for our phone bridge next we

have meg Sumner one of our public

affairs officers been collecting some

questions out from social media meg once

you go ahead and give us one yeah we

have one from twitter from laura keaney

my question for NASA is why two male

crew members for the ISS one-year

mission physiological effects of space

are different on men and women so let me

take that just scientifically so there

was no bias in the selection of the crew

members it was equally possible for a
woman to have been selected when we

00:56:12,469 --> 00:56:15,799
the one your crew selection it just so

00:56:13,909 --> 00:56:17,839
happened that this was the crew member

00:56:15,800 --> 00:56:19,670
that was selected what's really

00:56:17,840 --> 00:56:21,858
interesting is when we look at the

00:56:19,670 --> 00:56:24,440
radiation models for the lifetime

00:56:21,858 --> 00:56:26,420
effects in the cancer risks on crew

00:56:24,440 --> 00:56:28,789
members women are much more susceptible

00:56:26,420 --> 00:56:30,289
they have much higher risk of impacts

00:56:28,789 --> 00:56:33,199
from living in the radiation environment

00:56:30,289 --> 00:56:35,329
and so that does affect the ability of

00:56:33,199 --> 00:56:36,649
women to do longer duration missions it

00:56:35,329 --> 00:56:38,509
also affects the ability of women

00:56:36,650 --> 00:56:41,150
sometimes to do repeat missions over

00:56:38,510 --> 00:56:43,910
time so one of the things that I think
is really important for gender equity

and space exploration is actually to get

good countermeasures for some of these

radiation effects and that's something

that we're not primarily doing on ISS

we're primarily doing that in

ground-based research but it's a very

important area of work I'm also from

surrogates Garretson on Twitter what

resources are available for medical or

emotional needs on board during the year

long journey well the crew has access to

a number of things and probably the most

important ones are they have effectively
the ability to use a telephone and call friends family whoever they'd like to call email is also available and then there's a certain number of crew special activities where they can have a interaction with various guess that they select on the ground and then we also do a couple more things one of them is they have a family conference on a weekly basis and and then we also from the sort of the measure the medical side we sort of have the medical team that has some conferences with the crew just to kind of see how things are going so there's a
lot of our own systems onboard group

worked very hard to give crew members almost as much access to communicate on

or as they do on the ground so they have internet access as well Steve mentioned

we have the IP phone that's available to them whenever we have K you access which is a lion's share of the orbits we have

K you access we give the crews access to two movies in fact sometimes we've got them movies that are released to theaters before they release the

I think in one case we did that we are
in fact your special request we are

1469
00:58:31,440 --> 00:58:35,340
looking to get a bigger screen on orbitz

1470
00:58:33,389 --> 00:58:37,529
of the crews can have a better view of a

1471
00:58:35,340 --> 00:58:38,970
movie during during a movie night

1472
00:58:37,530 --> 00:58:42,540
whenever it is so we've taken a lot of

1473
00:58:38,969 --> 00:58:44,549
steps to make sure the crews have access

1474
00:58:42,539 --> 00:58:47,130
to communicate but also kind of the

1475
00:58:44,550 --> 00:58:48,630
normalcy of home so you know we get them

1476
00:58:47,130 --> 00:58:50,039
football games they won't football games

1477
00:58:48,630 --> 00:58:52,170
to all these kinds of things are steps

1478
00:58:50,039 --> 00:58:56,579
we take to try to make them feel like

1479
00:58:52,170 --> 00:58:58,230
they're still you know attached to to

1480
00:58:56,579 --> 00:58:59,489
life here on earth so that they can feel

1481
00:58:58,230 --> 00:59:02,670
as normal as they can give an

1482
00:58:59,489 --> 00:59:04,319
environment parent okay thanks Meg we're
just about out of time are there any

really quick follow-ups no okay then

that will go ahead and bring us to a

close again this is our briefing looking

at the launch of expedition 43 and the

one-year crew as always you can follow

along for the science on Twitter at ISS

underscore research you can follow Scott

Kelly on his journey at station see dr

kelly and as always you can follow the

hashtag hashtag is s 1 year you get all

the latest on our website at nasa.gov

slash station thank you for joining us

this morning have a good rest of the day