GOOD MORNING, EVERYBODY.

WELCOME TO THE NATIONAL PRESS CLUB.

MY NAME IS JOHN HUGHES I'M AN EDITOR AT BLOOMBERG FIRST WORD

THAT'S BLOOMBERG'S BREAKING NEWS DESK HERE IN WASHINGTON AND I'M THE PRESIDENT OF THE NATIONAL PRESS CLUB.

WE HAVE A HISTORIC DAY HERE IN THE NATIONAL PRESS CLUB.

OUR GUEST LIVE VIA VIDEO LINK FROM THE INTERNATIONAL SPACE STATION IS ASTRONAUT SCOTT KELLY.

HERE IN THE BALLROOM NEXT TO ME WE WELCOME ASTRONAUTS MARK KELLY AND TERRY IT'S VERY.

FIRST I WANT TO INTRODUCE OUR DISTINGUISHED HEAD TABLE.

THIS TABLE INCLUDES CLUB MEMBERS
AND GUESTS OF OUR SPEAKERS FROM

13
00:00:39,670 --> 00:00:43,660
THE AUDIENCE' RIGHT, DAVID
SHEPHERDSON WASHINGTON BUREAU

14
00:00:43,659 --> 00:00:46,549
CHIEF FOR THE DETROIT NEWS.

15
00:00:46,549 --> 00:00:50,578
ROBERT KOONTZ DEPUTY NEWS EDITOR
FOR PHYSICAL SCIENCE AT THE

16
00:00:50,579 --> 00:00:52,230
JOURNAL SCIENCE.

17
00:00:52,229 --> 00:00:56,768
COLONEL KATIE COLEMAN A NASA
ASTRONAUT.

18
00:00:56,768 --> 00:00:58,539
FRANK MORNING JR.

19
00:00:58,539 --> 00:01:02,268
EDITOR FOR
AVIATION WEEK.

20
00:01:02,268 --> 00:01:09,579
JERRY RIMSKY
CURRENT CHAIRMAN OF

21
00:01:09,579 --> 00:01:12,340
THE SPEAKER'S COMMITTEE.

22
00:01:12,340 --> 00:01:18,359
DANIEL SELNICK, PRESS CLUB
MEMBER WHO ORGANIZED THIS

23
00:01:18,359 --> 00:01:19,819
MORNING'S BREAKFAST.

24
00:01:19,819 --> 00:01:21,189
THANK YOU, DANNY.

25
CAPTAIN SAMANTHA FERETTI A EUROPEAN SPACE AGENCY ASTRONAUT.

ANDRE SETOFF BUREAU CHIEF FOR TASK THE NEWS AGENCY OF RUSSIA.

A REPORTER.

TOM McMAHON, VICE PRESIDENT OF ADVOCACY AND PUBLIC AFFAIRS FOR

UNMANNED VEHICLE SYSTEMS INTERNATIONAL AND A NATIONAL PRESS CLUB BOARD MEMBER.

WELCOME TO YOU ALL.

I ALSO WANT TO WELCOME OUR C-SPAN AND PUBLIC RADIO AUDIENCES AND OUR LIVE AUDIENCES WATCHING AROUND THE WORLD ON THE INTERNET.

CAN YOU FOLLOW THE ACTION ON TWITTER, USE THE #NPCLIVE.

#NPCLIVE ON TWITTER.
100 YEARS AGO ONE OF THE FIRST TRANSCONTINENTAL TELEPHONE CALLS

38
00:02:17.759 --> 00:02:21.049
WAS MADE FROM THE NATIONAL PRESS CLUB, A PHOTO ON THE WALL

39
00:02:21.050 --> 00:02:23.609
UPSTAIRS DOCUMENTS THAT HISTORIC MOMENT.

40
00:02:23.609 --> 00:02:26.909
I WANT ALSO MARKED THE FIRST TIME THAT A HIGH RANKING U.S.

41
00:02:26.908 --> 00:02:30.639
OFFICIAL WAS PHOTOGRAPHED AT THE NATIONAL PRESS CLUB BECAUSE IT

42
00:02:30.639 --> 00:02:34.939
WAS THEN SECRETARY OF STATE WILLIAM JENNINGS BRYAN WHO MADE

43
00:02:34.939 --> 00:02:37.900
THAT HISTORIC CALL TO SAN FRANCISCO.

44
00:02:37.900 --> 00:02:43.080
EARLIER THIS YEAR, VINCE SURF WHO HAS BEEN DOING SOME WORK FOR

45
00:02:43.080 --> 00:02:48.680
NASA ASKED THE QUESTION WHAT TO BE WITH 2015 EQUIVALENT OF THAT

46
00:02:48.680 --> 00:02:51.688
1915 PHONE CALL?

47
00:02:51.688 --> 00:02:56.049
WELL, SOME CONVERSATIONS THAT RESULTED FROM THAT QUESTION AND

48
00:02:56.049 --> 00:03:00.040
SOME COOPERATION FROM NASA LED US HERE TODAY FOR ANOTHER FIRST
FOR THE NATIONAL PRESS CLUB, A
LIVE PRESS CONFERENCE, LIVE

MESSAGING GOING UP TO SPACE AND
IT'S A HISTORIC DAY.

IT RAISES THE QUESTION FOR THE
NATIONAL PRESS CLUB PRESIDENT OF

2115 THAT IS WHO ARE YOU GOING
TO CALL AND HOW FAR AWAY ARE

YOU GOING TO REACH?

SO IT'S VERY FASCINATING THAT
WE'RE HERE TODAY AND I WANT TO

REMIND YOU ALL OUR ASTRONAUT IN
SPACE IS SCOTT KELLY.

KELLY WENT TO THE SPACE STATION
IN MAY TO BEGIN A 342 DAY STINT

THERE, AND THAT WILL BE -- I'M
SORRY -- THAT WAS MARCH NOT MAY,

THIS IS HIS BROTHER WHO JUST
CORRECTED ME.

THIS WILL BE THE LONGEST EVER
STINT BY A U.S. ASTRONAUT.

AND AS OF TODAY HE'S JUST UNDER
HALFWAY POINT TO MAKING HISTORY.

00:03:52,609 --> 00:03:55,808
HERE ON THE GROUND WE HAVE
SCOTT’S TWIN BROTHER, A RETIRED

00:03:55,808 --> 00:03:59,530
NASA ASTRONAUT CAPTAIN MARK
KELLY AND HE’S UNDERGOING A

00:03:59,530 --> 00:04:03,039
STUDY WITH HIS BROTHER TO
DETERMINE THE EFFECTS OF LONG

00:04:03,039 --> 00:04:06,578
DURATION SPACE FLIGHT ON THE
HUMAN BODY.

00:04:06,579 --> 00:04:11,109
WE ALSO HAVE HERE ON EARTH AIR
FORCE COLONEL TERRY VIRTS WHO IN

00:04:11,109 --> 00:04:15,710
JUNE WAS THE MOST RECENT
ASTRONAUT TO RETURN FROM THE

00:04:15,710 --> 00:04:18,009
INTERNATIONAL SPACE STATION.

00:04:18,009 --> 00:04:22,009
SO WE WELCOME OUR ASTRONAUTS
HERE ON THE GROUND AND I EXPECT

00:04:22,009 --> 00:04:26,090
THAT IN ABOUT A MINUTE WE WILL
BE HEARING FROM THE

00:04:26,089 --> 00:04:28,979
INTERNATIONAL SPACE STATION.

00:04:28,980 --> 00:04:33,780
WHAT YOUR GOING TO SAY TO YOUR
BROTHER IF YOU’RE ABLE TO SEND A

00:04:33,779 --> 00:04:35,079
MESSAGE TO HIM THIS MORNING?

73
00:04:35,079 --> 00:04:37,500
>> YOU WANT ME TO SAY IT TWICE?

74
00:04:37,500 --> 00:04:41,259
[ LAUGHTER ]
>> WAIT UNTIL WE GET HIM ON THE

75
00:04:41,259 --> 00:04:42,259
SCREEN.

76
00:04:42,259 --> 00:04:43,259
WE'LL BE SURPRISED.

77
00:04:43,259 --> 00:04:44,779
>> I TALKED TO HIM YESTERDAY.

78
00:04:44,779 --> 00:04:48,119
WE CAUGHT UP A LITTLE BIT ON
WHAT'S BEEN GOING ON.

79
00:04:48,120 --> 00:04:51,149
I HAD THE OPPORTUNITY TO --
THERE'S A PHONE ON THE SPACE

80
00:04:51,149 --> 00:04:54,149
STATION FOR FOLKS THAT DON'T
KNOW THAT.

81
00:04:54,149 --> 00:04:56,089
IT'S KIND OF LIKE AN INTERNET
CALL.

82
00:04:56,089 --> 00:04:58,089
THERE HE IS.

83
00:04:58,089 --> 00:04:59,419
>> THERE'S SCOTT.

84
00:04:59,420 --> 00:05:00,790
>> SCOTT, CAN YOU HEAR US?

85
00:05:00,790 --> 00:05:05,819
ARE YOU READY FOR THE EVENT?

I'M READY FOR THE EVENT.

NATIONAL PRESS CLUB THIS IS MISSION CONTROL HOUSTON PLEASE CALL STATION FOR VOICE CHECK.

STATION THIS IS NATIONAL PRESS CLUB.

HOW DO YOU HEAR ME?

I HAVE YOU LOUD AND CLEAR.

WELCOME ABOARD THE SPACE STATION.

WELCOME.

THANKS FOR JOINING US, SCOTT.

WE HAVE A FULL ROOM HERE.

I KNOW IT'S AROUND LUNCH TIME UP THERE.

WE JUST HAD BREAKFAST.

COULD YOU TELL US WHAT YOU'RE
DOING TODAY?

99 00:05:41,168 --> 00:05:44,168
>> FIRST OF ALL, IT'S GREAT TO
BE HERE WITH YOU GUYS TODAY.

100 00:05:44,168 --> 00:05:47,889
I KNOW YOU'RE HAVING BREAKFAST
BECAUSE BOTH MY BROTHER AND

101 00:05:47,889 --> 00:05:50,379
TERRY VIRTS THERE SENT ME
PICTURES OF THEIR FOOD.

102 00:05:50,379 --> 00:05:54,520
I GUESS THEY ARE TRYING TO MAKE
ME FEEL BAD ABOUT WHAT WE HAVE

103 00:05:54,519 --> 00:05:56,348
TO EAT UP HERE.

104 00:05:56,348 --> 00:05:59,319
BUT TODAY IS ACTUALLY A DAY OFF
FOR US BECAUSE WE HAD SOME CREW

105 00:05:59,319 --> 00:06:04,930
MEMBERS DEPARTING LATE LAST
WEEK, SO TODAY IS ACTUALLY A

106 00:06:04,930 --> 00:06:07,978
FREE DAY.
>> AND WHAT DO YOU DO ON YOUR

107 00:06:07,978 --> 00:06:14,428
DAY OFF ON THE INTERNATIONAL
SPACE STATION?

108 00:06:14,428 --> 00:06:18,329
>> YOU KNOW, WE HAVE A LOT OF
WORK UP HERE WITH OVER 400

109 00:06:18,329 --> 00:06:22,359
DIFFERENT SCIENCE EXPERIMENTS
DOING ON THROUGHOUT THE YEAR.
WE DO A LOT OF WORK ON THE DIFFERENT SYSTEMS THAT KEEP US ALIVE.

SO MOSTLY ON THE DAY OFF IT'S A TIME TO REST AND RECOVER FROM THE VERY HECTIC SCHEDULE.

I GENERALLY TAKE A LOT OF PICTURES OF EARTH, DO E-MAIL, MAYBE WATCH SOMETHING ON TV.

YESTERDAY WE WERE WATCHING THE TEXAN GAME AND THE BRONCOS GAME LATER.

THAT WAS NICE.

>> SO YOU'RE ABOUT HALFWAY TO YOUR YEAR LONG GOAL.

HOW DO YOU FEEL?

WHAT EFFECTS HAVE MICROGRAVITY HAD ON YOU SO FAR IN THIS ALMOST SIX MONTH PERIOD?
>> YES.

SO, YOU KNOW, I FEEL PRETTY GOOD OVERALL.

I DEFINITELY RECOGNIZE THAT I'VE BEEN UP HERE A LONG TIME AND HAVE, YOU KNOW, JUST AS LONG AHEAD OF ME.

BUT I FEEL, YOU KNOW, POSITIVE ABOUT IT.

I THINK, YOU KNOW, IF I MANAGE MY WORK, PACE OF WORK AND ENERGY RIGHT I'LL HAVE, YOU KNOW, ENOUGH IN THE TANK TO GET TO THE END.

I'M PRETTY SURE I WILL.

AS FAR AS PHYSICALLY, YOU KNOW I FEEL GOOD.

YOU KNOW WE HAVE SOME PRETTY GOOD EXERCISE EQUIPMENT UP HERE.

BUT THERE ARE A LOT OF EFFECTS OF THIS ENVIRONMENT THAT WE
CAN'T SEE OR FEEL, LIKE BONE LOSS, EFFECTS ON OUR VISION,

GENETICS, RNA, DNA PROTEINS AND THAT'S WHY WE'RE STEW DIG THIS

MYSELF AND MIsha ON THIS ONE YEAR FLIGHT.

THE JURY IS OUT ON THAT.

WE HAVE TO GET THE DATA AND HAVE THE SCIENTISTS ANALYZE IT AND

THEN, YOU KNOW, SUBMIT THE RESULTS FOR PEER REVIEW, THE

STUFF THAT SCIENTISTS DO.

SO HOPEFULLY WE'LL FIND OUT SOME GREAT THINGS ABOUT ME AND MY

COLLEAGUES SPENDING A YEAR IN SPACE.

>> SO THERE'S A LOT OF ATTENTION, A LOT OF INTEREST IN

GETTING TO MARS.

HOW WILL YOUR EFFORT UP THERE HELP US GET TO MARS?
SO, A LOT OF THE STUDIES WE'RE DOING FOCUSES ON, YOU KNOW, PARTICULARLY ME AND MY RUSSIAN COLLEAGUE MIKHAIL KORNIENKO LONGER DURATION SPACE FLIGHT THAN WE'VE DONE BEFORE.

THIS IS AN INCREDIBLE FACILITY WE HAVE, THE INTERNATIONAL SPACE STATION HAS A LOT OF CAPABILITY TO COLLECT DATA ON US.

YOU KNOW WE HAVE AN ULTRASOUND.

WE HAVE THESE DEVICES THAT MEASURE OUR VISION.

NEXT WEEK WE'LL DO A LOT OF THIS IMAGING AND DATA COLLECTION AND A RUSSIAN DEVICE THAT PULLS THE BLOOD DOWN TOWARDS OUR FEET.

LOWER BODY NEGATIVE PRESSURE DEVICE.

AND, YOU KNOW, FROM THESE EXPERIMENTS, WE'LL HOPEFULLY FIND OUT IF THERE ARE ANY CLIFFS
OUT THERE, IF OUR VISION GETS

159
00:09:19,089 --> 00:09:22,150
SIGNIFICANTLY WORSE, MAYBE
AFTER, YOU KNOW, NINE MONTHS OR

160
00:09:22,149 --> 00:09:26,100
A YEAR AND EVEN THOUGH THE
RUSSIANS HAVE FLOWN ON BOARD THE

161
00:09:26,100 --> 00:09:32,028
MIR SPACE STATION FOR A YEAR OR
LONGER IN A COUPLE OF CASES THEY

162
00:09:32,028 --> 00:09:36,320
DIDN'T HAVE THE TECHNOLOGY WE
HAVE TODAY TO FIGURE THIS OUT.

163
00:09:36,320 --> 00:09:40,459
YOU KNOW, THE SPACE STATION IS A
GREAT EXPERIMENT IN SUSTAINABLE

164
00:09:40,458 --> 00:09:44,208
ENERGY AND LIFE SUPPORT
EQUIPMENT AND UNDERSTANDING, YOU

165
00:09:44,208 --> 00:09:46,969
KNOW, HOW THAT WORKS AND HOW WE
CAN, YOU KNOW, MAINTAIN

166
00:09:46,970 --> 00:09:50,210
OURSELVES WITH THESE SYSTEMS FOR
LONGER PERIODS OF TIME.

167
00:09:50,210 --> 00:09:53,110
BOTH OF THOSE THINGS WILL HELP
US GO TO MARS SOME DAY AND

168
00:09:53,110 --> 00:09:56,409
HOPEFULLY IN THE NOT TOO DISTANT
FUTURE.

169
00:09:56,409 --> 00:10:00,110
>> AS PART OF WHAT'S HAPPENING
YOU'RE UNDERGOING A TWIN STUDY
170
00:10:00,110 --> 00:10:03,600
ALONG WITH YOUR BROTHER HERE ON
THE GROUND.

171
00:10:03,600 --> 00:10:04,980
EXPLAIN HOW THAT IS WORKING.

172
00:10:04,980 --> 00:10:09,940
DO YOU HAVE ANY RESULTS ON THE
TWIN STUDIES SO FAR, ANYTHING

173
00:10:09,940 --> 00:10:15,779
YOU CAN SHARE OR WON'T ANY OF
THIS BE KNOWN UNTIL AFTER YOUR

174
00:10:15,778 --> 00:10:23,090
EXPERIENCE IS DONE AND YOU
ANALYZE ALL THE DATA AFTERWARDS?

175
00:10:23,090 --> 00:10:26,230
>> YOU KNOW, I THINK MOST OF IT
WILL BE STUFF THAT WE LEARN

176
00:10:26,230 --> 00:10:27,310
AFTERWARDS.

177
00:10:27,309 --> 00:10:33,179
I HAVE HAD SOME INTERACTION WITH
SOME OF THE INVESTIGATORS.

178
00:10:33,179 --> 00:10:36,778
YOU KNOW, ONE THING THAT WAS, I
FOUND SOMEWHER INTERESTING,

179
00:10:36,778 --> 00:10:43,049
MAYBE NOT TOO UNEXPECTED, IS OUR
MICROBIO, YOU KNOW THE STUFF

180
00:10:43,049 --> 00:10:45,750
INSIDE OF US THAT'S NOT US.

181
00:10:45,750 --> 00:10:50,480
WE HAVE MORE CELLS OF BACTERIA
THAT WE CARRY AROUND WITH US
THAT, YOU KNOW, AREN'T, ISN'T PART OF OUR BODY BUT THEY JUST LIVE INSIDE OF US.

AND, YOU KNOW, ONE OF THE PRINCIPLE INVESTIGATORS TOLD ME THAT WHILE I WAS UP HERE THAT SHE FOUND IT INTERESTING THAT MY BROTHER'S AND I MICROBIO ARE COMPLETELY DIFFERENT.

IT'S NOT THAT UNEXPECTED BECAUSE WE DO LIVE SEPARATE LIVES BUT IT WAS KIND OF AN INTERESTING FACTOID I GUESS.

>> THE GOAL, HOWEVER IS AT THE END OF THIS YOU CAN DOCUMENT OR NASA WILL BE ABLE TO DOCUMENT AS NEVER BEFORE THE EFFECTS OF MICROGRAVITY ON A HUMAN USING A TWIN HUMAN TO REALLY GET IN AT A DETAILED LEVEL.

>> YEAH.
YOU KNOW, IT'S REALLY -- IT'S KIND OF A THING THAT MY BROTHER AND I ARE IDENTICAL TWINS AND ASTRONAUTS.

THE FACT HE IS AN ASTRONAUT AND HAS A LOT OF EXPERIENCE WITH NASA MEANS NOT ONLY IS HE COMFORTABLE DOING ALL OF THESE TYPES OF EXPERIMENTS AS A CONTROL PERSON, BUT ALSO NASA HAS A LOT OF DATA ON HIM GOING BACK TO WHEN WE INTERVIEWED IN 1995.

SO THEY CAN LOOK AT THAT DATA AND LOOK AT, YOU KNOW, THE DATA THEY COLLECT WITH HIM OVER THIS YEAR.

AND SEE WHAT KIND OF DEVIATIONS WE HAVE ON A GENETIC LEVEL, WHICH, YOU KNOW, COULD BE A RESULT OF THIS ENVIRONMENT, THE WEIGHTLESSNESS OF THE
ENVIRONMENT, THE RADIATION THAT WE SEE. AND, YOU KNOW, FROM THAT, FIGURE OUT OTHER AREAS WE NEED TO INVESTIGATE SO WE CAN, YOU KNOW, EVENTUALLY COMPLETE OUR JOURNEY TO MARS AND ELSEWHERE.

>> NASA ESTIMATES THAT THE RECENTLY DISCOVERED EARTH-LIKE PLANET IN THE KEPLER 452 STAR SYSTEM HAS DOUBLED THE EARTH'S GRAVITY.

THOSE SCIENTISTS MENTIONED YOUR HEROIC EXPERIMENTS AND THE EFFECTS ON GRAVITY AND WHEN TALKING ABOUT THIS. SO AS YOU ANTICIPATE THE PHYSICAL RECOVERY NEEDED TO RETURN TO EARTH'S GRAVITY FROM THE WEIGHTLESSNESS OF THE SPACE. STATION, HOW DO YOU THINK HUMANS COULD ONE DAY ADAPT TO GRAVITY
STRONGER THAN EARTH?

>> YOU KNOW, I GUESS, YOU KNOW, CHARLES DARWIN PROVED THAT, YOU

KNOW, THE SPECIES, DIFFERENT SPECIES IN GENERAL ARE VERY

ADAPTABLE TO THEIR ENVIRONMENT AND, YOU KNOW, SO I THINK OVER

THE LONG TERM IT WOULDN'T BE AN ISSUE, JUST LIKE WE LEARNED TO

LIVE AND WORK IN MICROGRAVITY ENVIRONMENT I'M SURE PEOPLE

WOULD BE ABLE TO LIVE AND WORK IN A, YOU KNOW, IN AN

ENVIRONMENT THAT'S TWICE THE AMOUNT OF GRAVITY, ALTHOUGH I

THINK, YOU KNOW, TO BE COMFORTABLE WITH THAT, IN THAT

SITUATION, PROBABLY TAKE A LITTLE BIT LONGER THAN TO GET

COMFORTABLE UP HERE, WEIGHING TWICE AS MUCH.

BUT, YOU KNOW, WHEN WE COME BACK FROM THE SPACE STATION WE DO
FEEL LIKE, YOU KNOW, YOU WEIGH 500 POUNDS, YOU KNOW, MORE THAN DOUBLE YOUR REAL WEIGHT. BUT IT'S SOMETHING YOU ADJUST TO VERY QUICKLY AND I THINK WE AS A SPECIES, YOU KNOW, THROUGHOUT EVOLUTION HAVE SHOWN WE'RE VERY ADAPTABLE.

>> SO HOW LONG HAS IT AND THE TO YOU GET USED TO THIS ENVIRONMENT OF MICROGRAVITY, AND IS IT A CONSTANT PROCESS OF ADJUSTMENT OR IS IT SOMETHING THAT YOU FIGURE OUT AND THEN IT'S JUST THERE?

>> YOU KNOW, THAT'S A REALLY GOOD QUESTION, AND, YOU KNOW,

ONE I'VE NEVER BEEN ASKED BEFORE, WHAT IS THE PROCESS OF ADJUSTING.
AND, YOU KNOW, SO FAR I FOUND THAT IT IS A CONTINUOUS THING.

YOU KNOW IT GETS, YOU KNOW, LESS SIGNIFICANT OVER TIME.

BUT I DO NOTICE, YOU KNOW, I CAN DO THINGS NOW THAT, YOU KNOW, I COULDN'T DO RIGHT WHEN I FIRST GOT UP HERE EVEN THOUGH I HAD FLOWN 180 DAYS IN SPACE BEFORE.

YOU KNOW MY ABILITY TO MOVE AROUND IS REALLY IMPROVED OVER TIME AND CONTINUES TO IMPROVE.

AND, YOU KNOW, YOU JUST GET MORE COMFORTABLE.

YOUR CLARITY OF THOUGHT IS GREATER.

YOUR ABILITY TO FOCUS, THINGS LIKE THAT.

SO, YOU KNOW, I FOUND THAT THE ADAPTATION HAS NOT STOPPED AND,

YOU KNOW, BE INTERESTING TO SEE WHERE I'M AT SIX MONTHS FROM
NOW.

>> I KNOW THAT ON EARTH WHEN THEY DO EXPERIMENTS, THERE YOU GO -- [ LAUGHTER ] -- THAT'S GOOD.

THAT'S GOOD.

ON EARTH WHEN THEY DO EXPERIMENTS THEY OFTEN PUT PEOPLE DOWN IN A CLOSE ENVIRONMENT AND LEAVE THEM THERE FOR MONTHS AT A TIME TO SEE HOW THEY INTERACT WITH ONE ANOTHER.

YOU'RE UP THERE FOR A LONG TIME WITH YOUR COLLEAGUE.

HOW ABOUT THE HUMAN COMPONENT OF THIS, THE HUMAN INTERACTION?

ARE THERE SUBJECTS THAT YOU NEED TO AVOID IN TALKING ABOUT OR HOW

DO YOU LEARN TO LIVE WITH ONE PERSON FOR SUCH A LONG TIME OR
PEOPLE SO LONG UP ON THE SPACE STATION?

>> YOU KNOW, I THINK PEOPLE FIND IT HARD TO BELIEVE, BUT, YOU KNOW, SO FAR IN MY OVER 300 DAYS, ACTUALLY APPROACHING A YEAR IN SPACE, I'VE NOTICED VERY FEW CONFLICTS.

I THINK NOT ONLY DOES NASA BUT OUR INTERNATIONAL PARTNERS DO A VERY GOOD JOB AT SELECTING PEOPLE THAT ARE, YOU KNOW, EASY TO GET ALONG WITH IN THIS TYPE OF A HARSH ENVIRONMENT.

SO, YOU KNOW, ESPECIALLY ON THIS FLIGHT I HAVEN'T HAD ANY ISSUES AND NOR DO I EXPECT TO HAVE ANY OR, YOU KNOW, PEOPLE EXPECT TO HAVE ISSUES WITH ME, HOPEFULLY NOT.

WE GET ALONG GREAT AND IT'S, YOU KNOW, WE'RE ALL ONE BIG TEAM UP
HERE.

WE REALIZE HOW WE RELY ON EACH OTHER ON A PSYCHOLOGICAL LEVEL.

BUT FOR OUR OWN PERSONAL SAFETY.

THAT GOES -- YOU KNOW IT'S JUST AS IMPORTANT WITH MY, YOU KNOW,

FELLOW ASTRONAUT UP HERE AS IT IS WITH MY OTHER INTERNATIONAL

COLLEAGUES INCLUDING THE RUSSIAN COSMONAUTS ON BOARD.

>> I'LL BRING IN YOUR BROTHER HERE IN A MINUTE.

DO YOU THINK THAT YOU OR MARK GOT THE BETTER END OF THE DEAL?

ON THE TWIN STUDY?

>> WELL, I THINK IT DEPENDS.

YOU KNOW, IT'S A PRIVILEGE TO FLY ON THIS FLIGHT BUT, YOU

KNOW, SOMETIMES WHEN HE SENDS ME PICTURES OF HIS BREAKFAST I'M A

288
00:17:38,410 --> 00:17:39,830
LITTLE ENVIOUS.

289 00:17:39.829 --> 00:17:44.519
[ LAUGHTER ]
>> AND, MARK, WHAT WOULD YOU SAY

290 00:17:44.519 --> 00:17:46.009
TO YOUR BROTHER?

291 00:17:46.009 --> 00:17:47.319
>> WHAT ABOUT BREAKFAST?

292 00:17:47.319 --> 00:17:49.288
[ LAUGHTER ]
>> SURE.

293 00:17:49.288 --> 00:17:52.529
>> I TALKED TO HIM YESTERDAY AND
WE CAUGHT UP ON A FEW THINGS.

294 00:17:52.529 --> 00:17:55.629
YOU KNOW THERE'S A PHONE ON THE
SPACE STATION SO WE CAN

295 00:17:55.630 --> 00:17:59.170
COMMUNICATE OTHER THAN, YOU
KNOW, THIS KIND OF SETTING.

296 00:17:59.170 --> 00:18:02.920
I WAS INTERESTED IN WHAT YOU
THOUGHT ABOUT THE HOUSTON TEXANS

297 00:18:02.909 --> 00:18:06.920
FIRST PERFORMANCE YESTERDAY.

298 00:18:06.920 --> 00:18:14.630
>> WELL, FORTUNATELY IT'S A LONG
SEASON, SO I'M VERY OPTIMISTIC

299 00:18:14.630 --> 00:18:15.630
THEY WILL IMPROVE.

300 00:18:15.630 --> 00:18:19.710
I THINK THERE ARE AREAS WHERE
THEY NEED TO.
BUT REGARDLESS OF HOW THEY DO I'M A HUGE FAN AND FEEL

FORTUNATE TO HAVE FOOTBALL SEASON HERE AND HAVE SOMETHING

TO LOOK FORWARD TO ON THE WEEKENDS.

>> I HAVE ANOTHER QUESTION FOR SCOTT PEOPLE MIGHT FIND

INTERESTING.

IN SPACE YOU HAVE HIS LEGS DOWN BUT NOT STANDING.

HIS FEET IS UNDER A HAND RAIL.

I THINK IT'S INTERESTING WHAT HAPPENS TO YOUR FEET IN SPACE.

IF YOU'RE COMFORTABLE SHARING THAT WITH FOLKS.

YOU KNOW, SO WE DON'T REALLY USE THE BOTTOM OF OUR FEET MUCH AND

SO OVER TIME ANY CALLUSES YOU HAVE ON YOUR FEET KIND OF FALL
OFF AND, YOU KNOW, AFTER ABOUT FIVE MONTHS UP HERE YOU HAVE

BABY FEET.

BUT THEN YOU HAVE A BIG CALLOUS ON THE TOP OF YOUR TOE, BIG TOE

BECAUSE YOU USE THAT TO MOVE AROUND.

WHEN I GOT BACK FROM MY LAST FLIGHT I WAS, YOU KNOW, A FEW DAYS AFTER THE FLIGHT I WAS GETTING A MASSAGE AT ONE OF THOSE MASSAGE CHAIN PLACES BECAUSE I WAS PRETTY SORE IN CERTAIN AREAS AND THE MASSEUSE SAYS YOU HAVE THE SOFTEST FEET I'VE EVER FELT IN MY WHOLE LIFE AND MY RESPONSE WAS THANK YOU, I'M VERY PROUD OF THEM.
BE A LONG EXPERIENCE OF LONG

325
00:19:44,829 --> 00:19:48,529
HUMAN SPACE FLIGHT MISSIONS AS
WE CONTEMPLATE MARS AND BEYOND

326
00:19:48,529 --> 00:19:49,990
IN OUR FUTURE.

327
00:19:49,990 --> 00:19:52,839
YOU HAVE BEEN UP THERE ABOUT
HALFWAY NOW TO YOUR FULL YEAR

328
00:19:52,839 --> 00:19:57,699
STINT, BUT DO YOU HAVE ANY
ADVICE THAT YOU WOULD GIVE TO

329
00:19:57,700 --> 00:20:02,319
FUTURE ASTRONAUTS WHO ARE GOING
TO BE SPENDING LONG DURATION IN

330
00:20:02,319 --> 00:20:10,408
SPACE, ANYTHING YOU'VE LEARNED
SO FAR THAT YOU PASS ON TO THEM?

331
00:20:10,409 --> 00:20:13,830
>> YOU KNOW, I WAS FORTUNATE
THAT I HAD FLOWN, YOU KNOW,

332
00:20:13,829 --> 00:20:16,609
ALMOST SIX MONTHS MY PREVIOUS
FLIGHT SO I SORT OF KNEW WHAT I

333
00:20:16,609 --> 00:20:18,009
WAS GETTING INTO.

334
00:20:18,009 --> 00:20:26,259
BUT, YOU KNOW, DESPITE THAT I
DID HAVE, YOU KNOW, CERTAIN, YOU

335
00:20:26,259 --> 00:20:29,609
KNOW, APPREHENSIONS HAVING TO GO
INTO SOMETHING THAT WILL

336
00:20:29,609 --> 00:20:34,979
ADMONISH THAN TWICE AS LONG, SO I INTENTIONALLY, YOU KNOW,

00:20:34,980 --> 00:20:39,269
THOUGHT ABOUT WAYS FOR ME TO GET TO TEND OF THIS WITH AS MUCH

00:20:39,269 --> 00:20:41,528
ENERGY AS I HAD IN THE BEGINNING.

00:20:41,528 --> 00:20:45,019
AND PART OF THAT IS HAVING A GOOD BALANCE BETWEEN WORK AND

00:20:45,019 --> 00:20:50,700
REST AND I INTENTIONALLY DON'T WORK AT THE SAME PACE I DID LAST

00:20:50,700 --> 00:20:55,380
TIME I WAS UP HERE WHERE, YOU KNOW, I FELT LIKE I COULD GO AT

00:20:55,380 --> 00:20:58,270
100% SPEED, YOU KNOW, FOR THE FULL SIX MONTHS.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.

00:20:58,269 --> 00:20:59,430
I CAN'T DO THAT.
JUST HAVE TO PACE YOURSELF.

I'VE HE IN REAR DONE A SPACEROAM WALK.

I'LL BE DOING ONE WITH THE GUY THAT JUST GOT SOMETHING OUT OF THE REFRIGERATOR.

[ LAUGHTER ]

SO WE BOTH LOOK FORWARD TO THAT.

THAT'S A CHALLENGE FOR THE TWO OF US.

BUT WHAT I'M LOOKING MOST FORWARD TO IS JUST GETTING TO
THE END OF THIS WITH AS MUCH ENERGY AND ENTHUSIASM AS I HAD IN THE BEGINNING AND DOING IT SAFELY AND COMPLETING ALL OUR MISSION OBJECTIVES AND GETTING ALL THE SCIENCE DONE.

>> OKAY, LAST QUESTION.

WHAT IS THE -- OF ALL THINGS THAT YOU MISS IN YOUR TIME AWAY FROM EARTH AND NOW AFTER SUCH A LONG TIME, WHAT'S THE TOP OF YOUR LIST THINGS YOU MISS FROM BECOME DOWN ON THE PLANET?

>> SO AFTER BEING WITH OTHER PEOPLE, YOU KNOW, PEOPLE YOU CARE ABOUT, YOUR FAMILY, YOUR FRIENDS, JUST GOING OUTSIDE.

I MEAN, THIS IS A VERY CLOSED ENVIRONMENT.

YOU KNOW, WE CAN NEVER LEAVE.
THE SMELLS, THE SOUNDS, EVERYTHING IS THE SAME.

SO, YOU KNOW, EVEN I THINK MOST PRISONERS CAN GET OUTSIDE OCCASIONALLY, YOU KNOW IN A WEEK.

BUT WE CAN'T. AND, YOU KNOW, THAT'S WHAT I MISS AFTER PEOPLE.

>> SCOTT KELLY, I WANT TO THANK YOU FOR JOINING US TODAY ON THIS HISTORIC DAY AT THE NATIONAL PRESS CLUB AND THE AUDIENCE WANTS TO SHOW ITS APPRECIATION BY GIVING YOU SOME APPLAUSE.

THANK YOU.

[ APPLAUSE ]

>> MY PLEASURE.

>>> ALL RIGHT.

SEE YOU LATER.
SOMEBODY PASSED UP A QUESTION AND MAYBE IT WAS ONE OF OUR --

>> BYE-BYE.

ONE OF OUR NEWS PHOTOGRAPHERS IN THE ROOM.

THERE WERE SOME LARGE CAMERAS IN THE PICTURES, TELEPHOTO LENS.

ARE THOSE TO TAKE PICTURES OF EARTH OR WHAT ARE THOSE USED FOR?

THOSE ARE FOR EARTH LAB WHERE SCOTT WAS, HAS A VERY LARGE WINDOW, VERY HIGH QUALITY.

SOMETIMES WE HAVE EXPERIMENTS IN THERE THAT TAKE PICTURES OF FARM, FIELDS, HOW THOSE ARE USED OR DIFFERENT EXPERIMENTS.

WHEN WE DON'T HAVE THE EXPERIMENT BLOCKING THE WINDOW
WE CAN GRAB THE CAMERA AND TAKE PICTURES.

SCOTT IS REALLY GOOD.

I HAVE A TENDENCY TO TAKE BIG PICTURE VIEW WHERE YOU CAN SEE THE EARTH.

SCOTT IS A FAN OF GETTING THAT 800 MILLIMETER TELESCOPE AND ZOOMING IN ON THE EARTH.

ONE OF THE FAVORITE THINGS WE DO IN SPACE TO TAKE PICTURES.

>> WHAT WAS THE ROOM THAT HE WAS COMING TO US FROM?

WHAT WAS THE PURPOSE OF THAT SPACE?

>> WE WERE IN THE LAB AND WE WERE LOOKING BACKWARDS TOWARDS THE RUSSIAN SEGMENT AND WHERE THE SHELF CAME FROM IS EXERCISE EQUIPMENT.
HE WAS EITHER RUNNING ON THE TREADMILL OR WE HAVE AN EXERCISE MACHINE THAT ALLOWS TO YOU DO BENCH PRESS AND SQUATS.

>> A U.S. LABORATORY.

HOW WOULD YOU AVOID -- HE MENTIONED MISSING GOING OUTSIDE.

WHAT WOULD YOU DO TO AVOID BEING STIR CRAZY UP THERE?

>> IT WAS FUNNY, I THINK IT WAS RIGHT AFTER SCOTT GOT THERE,

SAMANTHA AND I WERE THERE.

I MISSED EARTH AND THE RUSSIANS ACTUALLY WERE SENDING AUDIO CLIPS OF RAIN AND WIND AND BIRDS AND STUFF.

SO THERE WAS ONE WEEKEND WHERE EVERY LAPTOP -- THE STATION HAS

100 LAPTOPS AND WE PUT THIS RAIN SOUND.

IT WAS RAINING IN THE STATION FOR THE WHOLE WEEKEND.
IT WAS PRETTY COOL.

EVERY WHERE YOU WENT IT SOUNDED LIKE RAIN.

THAT WAS GOOD.

THAT'S ONE WAY TO COPE WITH IT.

MARK, I TALKED WITH YOUR BROTHER ABOUT THE TWIN STUDY.

WHAT IS YOUR ROLE IN THE TWIN STUDY HERE ON THE GROUND AND HOW MUCH TIME DOES IT TAKE?

SO FAR MY ROLE HAS BEEN TO PROVIDE SAMPLES.

BLOOD, SALIVA, OTHER THINGS I WON'T GO INTO.

AND BE THERE FOR MRIs AND ULTRASOUNDS AND SOME EXPERIMENTS.

SOMETIMES I'M LAYING IN A
CONTRAPTION, I DON'T KNOW WHAT

00:26:03,839 --> 00:26:05,389
THEY ARE TRYING TO FIGURE OUT.

00:26:05,390 --> 00:26:08,390
DO WHATEVER YOU HAVE TO DO.

00:26:08,390 --> 00:26:12,278
SO IT'S PROVIDING DATA OVER AN
EXTENDED PERIOD OF TIME.

00:26:12,278 --> 00:26:14,670
SO SOMETIMES I'LL VISIT HOUSTON.

00:26:14,670 --> 00:26:18,509
AND MEET WITH THE RESEARCHERS
AND SPEND A WHOLE DAY GIVING

00:26:18,509 --> 00:26:20,009
DATA.

00:26:20,009 --> 00:26:23,089
SOMETIMES THEY WILL SEND
SOMEBODY TO TUCSON OR EVEN ONCE

00:26:23,089 --> 00:26:26,359
TO NEW YORK CITY TO COLLECT DATA
FROM ME.

00:26:26,359 --> 00:26:29,069
WE'LL DO THIS WHILE MY BROTHER
IS IN SPACE BUT THEN I THINK

00:26:29,069 --> 00:26:36,089
ALSO AFTER HE GETS BACK FOR A
PERIOD OF TIME.

00:26:36,089 --> 00:26:40,839
FROM WHAT WE UNDERSTAND FROM
SOME OF THESE RESEARCHERS, ONE

00:26:40,839 --> 00:26:42,679
OF THEM RECENT LEADERSHIP SAID
THAT THEY ARE GOING TO HAVE MORE
INFORMATION ON SCOTT AND I ON OUR, YOU KNOW, MOLECULAR AND GENETIC INFORMATION THAN ANY OTHER HUMAN EVER, YOU KNOW, THAT WAS NOT AN OFFICIAL POSITION BUT THIS IS WHAT ONE OF THE RESEARCHERS, THEIR COMMENTS ON THIS STUDY. AND THERE'S PROBABLY 10 TO 12 DIFFERENT EXPERIMENTS OR AT LEAST DIFFERENT UNIVERSITIES DOING EXPERIMENTS FROM ALL THE WAY FROM THE UNIVERSITY OF FRANKFURT TO STANFORD, HARVARD, MEDICAL SCHOOL, JOHNS HOPKINS, UNIVERSITY OF PENNSYLVANIA, PURDUE. SO RESEARCH UNIVERSITIES. IT WILL BE INTERESTING TO SEE WHAT THE DATA SHOWS ON THE GENETIC AND MOLECULAR MOSTLY
EFFECTS FROM THIS LONG DURATION

00:27:28,279 --> 00:27:29,279
SPACE FLIGHT.

00:27:29,279 --> 00:27:34,048
MY BROTHER MENTIONED THAT THERE MIGHT BE A CLIFF, AND I DON'T

00:27:34,048 --> 00:27:38,460
THINK -- YOU KNOW, I THINK THAT NEED A LITTLE BIT FURTHER

00:27:38,460 --> 00:27:39,500
EXPLANATION, RIGHT.

00:27:39,500 --> 00:27:42,769
WE HAVE DATA ON A LOT OF PEOPLE AFTER SIX MONTHS FOR BEING IN

00:27:42,769 --> 00:27:43,798
SPACE.

00:27:43,798 --> 00:27:47,379
WE HAVE A PRETTY GOOD IDEA OF WHAT HAPPENS IN THAT SIX MONTH

00:27:47,380 --> 00:27:48,380
PERIOD.

00:27:48,380 --> 00:27:50,440
WE HAVE NO DATA BEYOND SIX MONTHS.

00:27:50,440 --> 00:27:52,490
SO MAYBE THERE BECOMES A BEND IN THE CURVE.

00:27:52,490 --> 00:27:55,460
WHAT I MEAN BY IS THAT WE KNOW PEOPLE'S VISION GETS WORSE OVER

00:27:55,460 --> 00:27:57,048
THE SIX MONTH PERIOD.
MAYBE AT NINE MONTHS OR TEN MONTHS MAYBE IT GETS REALLY, REALLY BAD.

IMAGINE YOU'RE TRYING TO SEND A CREW TO GO WORK AND LIVE ON MARS FOR AN EXTENDED PERIOD OF TIME BUT BY THE TIME THEY GET THERE WE FIND OUT THEY WILL BE NEARLY BLIND FROM THE ENVIRONMENT.

THAT'S A BIG PROBLEM.

SO THAT'S PART OF THE IDEA OF DOING THIS RESEARCH OVER A ONE YEAR PERIOD IS TO FIGURE OUT IF THERE ARE ANY OF THESE BENDS IN THE CURVE.

>> WHAT ARE THE THOUGHTS OF BOTH OF YOU ON HOW SOON WE CAN GET TO HARASS?

-- TO MARS?
OUR ABILITY TO GET TO MARS IS NOT SO MUCH BASED ON THE TECHNOLOGY TO DO THAT.

THAT PART WE CAN FIGURE IT OUT.

WE CAN FIGURE OUT THE ENGINEERING AND PROPULSION SYSTEM AND WE CAN FIGURE OUT WHAT IT WILL TAKE TO MITIGATE THESE PHYSIOLOGICAL EFFECTS.

THE LIMITING FACTOR AND THE THINGS, REALLY THAT CONTROLS WHEN WE ACTUALLY DO THIS IS THE PUBLIC'S DESIRE TO DO IT.

YOU KNOW, WE WILL NEED A LOT OF PUBLIC SUPPORT IF WE'RE GOING TO TAKE ON THAT KIND OF ENDEAVOR TO PUT A PERSON ON MARS AND THAT PUBLIC SUPPORT THEN MEANS WE GET CONGRESSIONAL SUPPORT AND SUPPORT OF THE ADMINISTRATION IN
THE WHITE HOUSE.

494
00:29:18,700 --> 00:29:20,480
THAT'S THE MOST IMPORTANT THING.

495
00:29:20,480 --> 00:29:24,519
BECAUSE, YOU KNOW, A CHALLENGE
LIKE SENDING SOMEBODY TO, YOU

496
00:29:24,519 --> 00:29:27,769
KNOW, SENDING PEOPLE TO MARS IS
GOING TO BE EXPENSIVE AND TAKE A

497
00:29:27,769 --> 00:29:29,630
LONG TIME.

498
00:29:29,630 --> 00:29:33,809
SO WITHOUT THAT PUBLIC SUPPORT,
I WOULD SAY IT WON'T HAPPEN.

499
00:29:33,808 --> 00:29:37,779
>> NOW BOTH OF YOU HAVE SPENT
TIME IN THE STATION AND HAD THAT

500
00:29:37,779 --> 00:29:42,220
EXPERIENCE OF ADJUSTING BACK TO
EARTH'S GRAVITY AND SCOTT WILL

501
00:29:42,220 --> 00:29:45,409
HAVE THAT IN A MORE SIGNIFICANT
WAY ONE IMAGINES BECAUSE OF THE

502
00:29:45,409 --> 00:29:47,990
LENGTH OF TIME HE'LL BE UP
THERE.

503
00:29:47,990 --> 00:29:51,839
BUT WHAT ARE THE THREE OR SO
MOST UNIQUE THINGS THAT YOUR

504
00:29:51,839 --> 00:29:55,939
BODY EXPERIENCES THAT YOU GO
THROUGH WHEN YOU TRANSITION BACK

505
00:29:55,940 --> 00:29:59,920
TO EARTH FROM A PERIOD OF TIME
UP IN THE SPACE STATION?

00:29:59,920 --> 00:30:00,920
>> IT'S INTERESTING.

00:30:00,920 --> 00:30:03,570
AFTER MY SHUTTLE FLIGHT WHICH
WAS RELATIVELY SHORT DURATION,

00:30:03,569 --> 00:30:07,599
ONLY TWO WEEKS, I REALLY FELT
HEAVY, MORE THAN ANYTHING.

00:30:07,599 --> 00:30:11,689
I FELT SENSE OF GRAVITY WAS
PRETTY SIGNIFICANT.

00:30:11,690 --> 00:30:16,159
AND AFTER MY STATION FLIGHT OF
200 DAYS IT WAS, I FELT HEAVY

00:30:16,159 --> 00:30:20,470
BUT THE MAIN SENSATION I HAD WAS
ONE OF BEING DIZZY.

00:30:20,470 --> 00:30:23,720
YOU COULD STILL WALK AND STUFF
BUT I REALLY -- IT TOOK A FEW

00:30:23,720 --> 00:30:26,450
DAYS BEFORE THAT DIZZINESS
ABATED.

00:30:26,450 --> 00:30:29,600
BUT THE THING THAT REALLY
SURPRISED ME ABOUT THE STATION

00:30:29,599 --> 00:30:33,308
FLIGHT 200 DAYS WAS HOW QUICKLY
I ADAPTED BACK TO EARTH.

00:30:33,308 --> 00:30:38,139
I WAS PREPARED FOR MUCH WORSE
AND HAD MONTHS OF, YOU KNOW,
LINGERING EFFECTS.

I ADAPTED A LOT QUICKER THAN I THOUGHT.

>> WAS THAT ALSO YOUR EXPERIENCE FROM THE TRANSITION?

>> WELL, I FLEW FOUR FLIGHTS BUT THEY WERE ALL AROUND TWO WEEKS OR A LITTLE BIT MORE OR A LITTLE BIT LESS.

SO I DON'T HAVE THAT EXPERIENCE OF BEING IN SPACE FOR AT THAT LONG PERIOD OF TIME.

MY OBSERVATION HAS BEEN THAT WHEN YOU'RE FLYING A SPACE SHUTTLE MISSION, YOU KNOW, IT IS LIKE A TWO WEEK TRAIN WRECK OF TRYING TO OPERATE AND GET EVERYTHING YOU NEED TO COMPLETE IN THIS VERY SHORT PERIOD OF TIME.

SO YOU HAVE A LOT OF CREW MEMBERS WORKING VERY FAST.
YOU DON'T HAVE A LOT OF TIME TO EXERCISE.

IMPORTANT TO EXERCISE IN SPACE.

SO ON A SPACE SHUTTLE MISSION I'LL EXERCISE TWO OR THREE TIMES.

WHERE YOU HAVE SPACE STATION CREW MEMBERS AND THEN THEY ARE IN SPACE FOR SIX MONTHS THEY ARE DOING A SIGNIFICANT AMOUNT OF EXERCISE ALMOST EVERY SINGLE DAY.

SO I THINK THAT'S WHAT REALLY HELPS.

I THINK THAT'S WHY YOU ACCLIMATED PRETTY WELL AFTER 200 DAYS IN SPACE, AND IT PROBABLY DIDN'T FEEL A LOT DIFFERENT THAN BEING IN SPACE FOR JUST A COUPLE OF WEEKS, PROBABLY BECAUSE OF THE AMOUNT, YOU KNOW, THE AMOUNT
OF EXERCISE AND AMOUNT OF WORK

541 00:31:47,579 --> 00:31:51,759
YOU'RE DOING, YOU KNOW, DURING
THAT TIME IN SPACE.

542 00:31:51,759 --> 00:31:56,519
>> I THINK BOTH OF YOU WOULD
AGREE THAT TECHNOLOGY IS

543 00:31:56,519 --> 00:31:58,669
IMAGINABLE ON GETTING TO MARS.

544 00:31:58,669 --> 00:32:03,320
WHAT HAPPENS WITH OUR ASTRONAUTS
ONCE THEY GET THERE, HOW DO WE

545 00:32:03,319 --> 00:32:08,619
HANDLE MAKING IT SO ASTRONAUTS
CAN LIVE THERE, HOW DIFFICULT

546 00:32:08,619 --> 00:32:09,619
WILL THAT BE?

547 00:32:09,619 --> 00:32:12,518
DO WE HAVE ANY IDEA HOW LONG
THEY WOULD BE ABLE TO STAY

548 00:32:12,519 --> 00:32:16,720
BEFORE COMING BACK OR WOULD THEY
JUST NOT COME BACK?

549 00:32:16,720 --> 00:32:19,960
>> WILL WE SEE THAT IN A MOVIE
IN ABOUT A WEEK OR SO?

550 00:32:19,960 --> 00:32:20,960
>> YEAH.

551 00:32:20,960 --> 00:32:24,179
WAIT TO SEE THE MOVIE AND READ
THE BOOK ALSO.

552 00:32:24,179 --> 00:32:27,809
I THINK THERE'S TWO WAYS TO GO
TO MARS AND THIS IS A BIG

553
00:32:27,808 --> 00:32:28,950
QUESTION THAT NEEDS ANSWERED.

554
00:32:28,950 --> 00:32:32,059
YOU CAN GO THE SLOW BOAT WAY
USING THE TRADITIONAL CHEMICAL

555
00:32:32,059 --> 00:32:34,250
ROBERT.

556
00:32:34,250 --> 00:32:37,589
IF YOU DO THAT IT TAKES SIX TO
NINE NOS GET THERE.

557
00:32:37,589 --> 00:32:40,170
THEN YOU HAVE TO WAIT FOR EARTH
AND MARS TO GO AROUND THE SUN TO

558
00:32:40,171 --> 00:32:42,850
CATCH UP AGAIN BEFORE YOU CAN
COME HOME.

559
00:32:42,849 --> 00:32:44,740
YOU SPEND A YEAR AND A HALF ON
THE SURFACE.

560
00:32:44,740 --> 00:32:46,589
ANOTHER SIX MONTHS TO COME HOME.

561
00:32:46,589 --> 00:32:51,159
THREE YEAR MISSION WHICH IS A
LONG TIME FOR YOUR WATER SYSTEMS

562
00:32:51,160 --> 00:32:54,120
NETWORK AND YOUR CARBON DIOXIDE
TO WORK.

563
00:32:54,119 --> 00:32:55,769
IT'S A LOT OF FOOD TO PACK.

564
00:32:55,769 --> 00:32:57,558
IT'S A BIG THING.
00:32:57,558 --> 00:33:01,109
THE FAST BOAT TO MARS IS TO DO WHAT WE CALL ELECTRIC

00:33:01,109 --> 00:33:02,199
PROPULSION.

00:33:02,200 --> 00:33:06,960
IT'S USING ELECTRICITY, PUMP OUT THE PROPELLANT REALLY FAST OUT

00:33:06,960 --> 00:33:10,169
THE BACK END AND THE SPACESHIP GOES FASTER.

00:33:10,169 --> 00:33:12,580
GET TO MARS IN A FEW WEEKS.

00:33:12,579 --> 00:33:14,839
SPEND A COUPLE OF MONTHS AND COME BACK.

00:33:14,839 --> 00:33:22,079
BUT YOU NEED A NUCLEAR REACTOR IN SPACE.

00:33:22,079 --> 00:33:28,109
HUMAN BODY IS MITIGATED.

00:33:28,109 --> 00:33:30,689
YOUR SYSTEMS DON'T HAVE TO LAST AS LONG.

00:33:30,690 --> 00:33:33,669
THAT'S A DECISION WE HAVE TO MAKE HOW TO GET THERE EITHER THE

00:33:33,669 --> 00:33:35,840
FAST OR SLOW WAY.

00:33:35,839 --> 00:33:40,759
>> IF WE MADE THE DECISION AND IF CONGRESS GOT BEHIND IT, HOW

577
FAR AWAY ARE WE FROM REALISTICALLY ACHIEVING THIS, DO YOU THINK?

>> WELL THE FIRST HUMAN IN SPACE HAPPENED IN 1961 AND WE WERE ON THE MOON IN 1969.

SO THERE'S A HISTORICAL CONTEXT.

GETTING TO MARS, ACTUALLY GETTING TO MARS TAKES LONGER THAN GETTING TO THE MOON.

IT COULD BE DONE IN A DECADE OR TWO, MAYBE.

BUT I THINK MARK SAID IT, HIS ANSWER WAS VERY WELL, BUT IT'S MORE A QUESTION OF POLITICAL SCIENCE THAN ROCKET SCIENCE.

>> LEAPT ME ASK YOU ABOUT NASA IN GENERAL.

AS SOMEONE WHO GREW UP WITH APOLLO AND FOR ME APOLLO 15 WAS
THE END ALL BECAUSE I WAS 7 YEARS OLD.

I DIDN'T REMEMBER "APOLLO 11," BUT I HAD THE ASTRONAUT THE

DOLLS OR WHATEVER YOU WANT TO CALL THEM, THE LITTLE GUYS I

PLAYED WITH.

NASA WAS A HUGE DEAL.

Then in more recent years there was some thought that NASA had come on harder times.

We were relying on the Russians more and NASA's glory days were over.

Then when he the Pluto through by, so much excitement created

AND NASA SeEMED TO BE HIP AGAIN.

WHAT IS YOUR VIEW OF WHERE WE ARE WITH OUR SPACE AGENCY HERE
IN THE UNITED STATES?

AND WHAT DO WE NEED TO DO IF ANYTHING TO PUT IT ON THE RIGHT FUTURE COURSE?

>> I CAN TALK ABOUT WHAT WE'RE DOING NOW AND I'LL LET MARK FINISH.

THERE'S A LOT GOING ON AT NASA.

THE PLUTO MISSION OBVIOUSLY, MARS ROVERS, THREE ROVERS ACTIVE NOW.

THE MARS PROGRAM IS VERY ROBUST.

HUMAN SPACE FLIGHT IS VERY ROBUST.

SAMANTHA AND I GOT BACK FROM A LONG FLIGHT.

SO NASA IS VERY INVOLVED IN SPACE EXPLORATION ALL ASPECTS

OF IT ROBOTICALLY AND HUMANLY.
IT'S NOT GONE AWAY AT ALL.

WE ARE FLYING WITH THE RUSSIANS RIGHT NOW AND THAT WAS ONE OF THE HIGHLIGHTS OF MY MISSION WAS GETTING A CHANCE TO WORK WITH RUSSIAN COLLEAGUES AND WORK ON THE SOYUZ.

THAT WAS A GREAT EXPERIENCE.

SOON WE'LL BE FLYING ON AMERICAN VEHICLES AGAIN.

NASA IS VERY BUSY.

IT HASN'T ENDED IN ANY WAY, SHAPE OR FORM AND THERE'S A VERY BRIGHT FUTURE.

HERE IN THE UNITED STATES WE HAVE THE BEST SCIENTISTS AND ENGINEERS IN THE WORLD.

AND I THINK WE CAN DO ANYTHING WE SET OUR MINDS TO.
REALLY ANYTHING.

WE WANT TO, ESPECIALLY, YOU KNOW, IN SPACE FLIGHT, IT'S CHALLENGING BUT WE HAVE THE RESOURCES TO DO THESE THINGS.

I THINK WHAT WE NEED TO DO IS PICK EXCITING MISSIONS THAT THE PUBLIC WILL BE INTERESTED IN.

LIKE THE PLUTO MISSION.

BEING SOMEBODY WHO USED TO WORK AT NASA AND FLY IN SPACE, EVEN I THOUGHT THAT WAS PRETTY NEAT TO SEE PLUTO UP CLOSE FOR THE FIRST TIME, SO SEE THOSE IMAGES COME BACK AND START TO LEARN MORE.

ABOUT SOMETHING THAT IS OR ISN'T A PLANET, I DON'T KNOW WHAT IT IS TODAY.

SO WE GOT PICK THESE EXCITING MISSIONS.
WE GOT TO ALLOW NASA TO DO THIS.

WHAT OFTEN HAPPENS IS YOU’LL SEE, YOU KNOW, WE’LL BE ASKED TO...

DO SOMETHING AND THEN EITHER SOMETIMES NASA WILL CANCEL IT OR THE WHITE HOUSE WILL CANCEL IT.

YOU KNOW WE GOT UNDER THAT THESE THINGS, DESPITE, YOU KNOW, THE ABILITY OF OUR SCIENTISTS AND ENGINEERS TO DO THESE THINGS THEY DO TAKE A LONG PERIOD OF TIME.

OFTEN, YOU KNOW, FROM ONE ADMINISTRATION IN THE WHITE HOUSE TO THE NEXT.

SO I THINK PEOPLE JUST NEED TO BE PATIENT.

WE NEED TO GIVE NASA THE RESOURCES TO DO THESE HARD...
THINGS.

00:37:21.929 --> 00:37:25.339
BUT, YOU KNOW, WE HAVE THE
PEOPLE AND THE ABILITY TO

00:37:25.340 --> 00:37:28.200
ACCOMPLISH EXCITING THINGS IN
SPACE.

00:37:28.199 --> 00:37:32.000
>> TERRY, WE HEARD SCOTT EARLIER
SAY HE WAS LOOKING FORWARD TO

00:37:32.000 --> 00:37:34.050
HIS SPACEWALK.

00:37:34.050 --> 00:37:37.680
YOU COMPLETED THREE SPACE WALKS
DURING YOUR MISSION AND THIS

00:37:37.679 --> 00:37:41.079
HEAD PREPARE THE SPACE STATION
FOR THE BOEING AND SPACEX

00:37:41.079 --> 00:37:46.789
COMMERCIAL CREW VESSELS AND YOU
GAVE US SOME AMAZING GO FROM

00:37:46.789 --> 00:37:50.429
IMAGERY AND MADE US FEEL LIKE WE
WERE THERE TOO.

00:37:50.429 --> 00:37:55.000
BUT CAN YOU TELL US WHAT IT WAS
LIKE TO BE OUT ON THESE SPACE

00:37:55.000 --> 00:37:58.699
WALKS AND DOING THIS SORT OF
WORK?

00:37:58.699 --> 00:37:59.750
>> YEAH.

00:37:59.750 --> 00:38:02.400
IT WAS DEFINITELY A UNIQUE -- I HAD A CHANCE TO DO A LOT OF

00:38:02,400 --> 00:38:03,400
STUFF IN LIFE.

00:38:03,400 --> 00:38:05,030
THAT WAS UNIQUE.

00:38:05,030 --> 00:38:07,090
GOING OUTSIDE FOR THE FIRST TIME.

00:38:07,090 --> 00:38:11,450
IN THE POOL WE PRACTICED DOING SPACE WALKS IN WEIGHTLESS POOL.

00:38:11,449 --> 00:38:15,319
YOU GO OUT OF THE AIR LOCK, THERE'S A MODULE.

00:38:15,320 --> 00:38:16,870
IT'S ABOUT FROM THERE TO THERE.

00:38:16,869 --> 00:38:20,670
I REACH OVER AND GREEN BAY AND MOVE ON TO WHERE I'M DOING MY

00:38:20,670 --> 00:38:21,670
WORK.

00:38:21,670 --> 00:38:24,760
ON MY VERY FIRST SPACEWALK I WENT TO DO THAT.

00:38:24,760 --> 00:38:26,080
NOPE I'M NOT GOING TO DO THAT.

00:38:26,079 --> 00:38:28,989
I STAYED ON THE SIDE OF THE SPACE STATION AND DIDN'T TAKE

00:38:28,989 --> 00:38:30,649
THE SHORTCUT.
BUT IT IS AN AMAZING EXPERIENCE TO LOOK AND SEE THE EARTH.

I FELT LIKE MAYBE A MINUTE OR TWO TO DO THAT.

ALL THREE OF MYSPACE WALKS THEY ARE SO BUSY AND SO MANY TASKS TO HAPPEN.

I DIDN'T FEEL I HAD FREE TIME.

IT WAS LIKE WORK, WORK.

IT WAS MORE A SHUTTLE FLIGHT THAN A STATION FLIGHT.

MARK WITH THE INTERNATIONAL SPACE STATION IT'S ALMOST LIKE WE'RE SO USED TO IT WE'RE ALMOST TAKING IT FOR GRANTED.

WHAT CAN TO BE DONE IMPROVE THE SCIENTIFIC OUTPUT OF THE SPACE STATION AND THE IMPACT IT HAS?

>> WELL, MY BROTHER MENTIONED THAT THEY'VE GOT OVER THE PERIOD
OF TIME HE'S GOING BE THERE THERE'S 400 DIFFERENT

EXPERIMENTS GOING ON IN A BUNCH OF DIFFERENT LABORATORIES.

U.S. LABORATORY, JAPANESE LABORATORY, A EUROPEAN LABORATORY ON BOARD.

THE RUSSIANS DO SCIENCE IN THE RUSSIAN SEGMENT.

IT'S AN INCREDIBLE, YOU KNOW, FACILITY.

THERE'S A LOT GOING ON.

TO EXPAND, YOU KNOW, THE OUTPUT OF THE SPACE STATION YOU JUST NEED MORE PEOPLE.

SPACE STATION WAS FIRST LAUNCHED IN 1998.

SO 17 YEARS NOW.

STARTING TO GET KIND OF OLD.

THINGS BREAK.
PEOPLE HAVE TO FIX THINGS WHEN THEY BREAK.

THAT TAKES TIME AWAY FROM DOING THE SCIENCE.

YOU KNOW, YOU DON'T HAVE AN ELECTRICIAN OR PLUMBER.

YOU DON'T HAVE SOMEBODY TO CLEAN THE PLACE UP.

SO CREW MEMBERS ARE THE, YOU KNOW, THEY ARE THE MECHANICS,

SCIENTIST, THE SECRETARY, THE GUY WHO IS FIXING THE TOILET

WHEN THAT BREAKS.

YOU HAVE -- YOU'RE THE MAID, YOU'RE CLEANING UP ON THE WEEKEND.

OR DURING THE WEEK.

SO IT REALLY COMES DOWN TO CREW TIME.

BUT TO ADD CREW MEMBERS IT'S COMPLICATED.
YOU HAVE MORE CREW MEMBERS ON BOARD NOW YOU NEED ANOTHER RETURN VEHICLE ON BOARD THAT ACTS AS A LIFEBOAT IF SOMETHING HAPPENS. IT ALSO NEEDS THEN THOSE EXTRA PEOPLE YOU NEED BE ABLE TO SUPPORT THEM NOT ONLY WITH FOOD AND WATER, BUT OXYGEN.

AIR TO BREATH AND CARBON DIOXIDE OUT OF THE ATMOSPHERE.

IT GETS REALLY COMPLICATED AND HARD TO DO.

JUST TO ANSWER YOUR QUESTION WE WOULD NEED MORE PEOPLE TO GET MORE OUT OF IT.

THE INTERNATIONAL SPACE STATION LIVING UP TO ITS NAME HAS BEEN SUCH AN INTERNATIONAL EFFORT.

DO YOU FORESEE WHEN HE LOOK AT
MARS AND LONG SPACE FLIGHT

00:40:55,719 --> 00:40:58,669
MISSIONS IN THE FUTURE, DO YOU ENVISION THESE WILL BE

00:40:58,670 --> 00:41:04,110
INTERNATIONAL COLLABORATIONS OR MORE U.S. EFFORTS.

00:41:04,110 --> 00:41:07,970
>> MY OWN PERSONAL VIEW IT WILL DEFINITELY BE INTERNATIONAL.

00:41:07,969 --> 00:41:10,879
THE REASON THE INTERNATIONAL SPACE STATION SURVIVED IF YOU

00:41:10,880 --> 00:41:14,579
LOOK AT THE HISTORY OF IT BACK IN THE '90s, THE INTERNATIONAL

00:41:14,579 --> 00:41:17,840
PROGRAM ASPECT OF IT ALLOWED IT TO MAKE IT THROUGH CONGRESS AND

00:41:17,840 --> 00:41:20,920
GOING BACK TO THE POLITICAL SCIENCE VERSUS ROCKET SCIENCE

00:41:20,920 --> 00:41:24,260
ASPECT OF IT, THE INTERNATIONAL PROGRAM MAKES IT SOMETHING THAT

00:41:24,260 --> 00:41:27,060
CAN SURVIVE OVER LONGER PERIOD OF TIME.

00:41:27,059 --> 00:41:31,650
>> PLUS IT'S GREAT TO HAVE THE INGENUITY AND GAIN SOME

00:41:31,650 --> 00:41:34,760
EFFICIENCIES HAVING DIFFERENT COUNTRIES BUMMED DIFFERENT
MODELS SO ONE COUNTRY DOESN'T HAVE TO BUILD THE ENTIRE PROGRAM.

>> SOMEBODY PASSED UP A QUESTION ABOUT ELON MUSK WHO RECENTLY TALKED ABOUT MARS AND USING A THERMAL NUCLEAR DEVICE AS AN OPTION TO MAKE MARS MORE HABITABLE.

ANY THOUGHT, COMMENT ON THAT?

I SAW THAT IN THE NEWSPAPER.

I DON'T KNOW THE SCIENCE BEHIND NUKING A PLANET.

[ LAUGHTER ]

BUT I WILL TELL YOU ELON IS A VERY SMART GUY AND HE DOES THINK OUTSIDE OF THE BOX.

WHEN YOU LOOK WHAT HE'S BEEN ABLE TO ACCOMPLISH NOT ONLY WITH SPACEX LAUNCHING CARGO TO THE INTERNATIONAL SPACE STATION,
HOPEFULLY PEOPLE HERE PRETTY SOON, YOU KNOW, INCREDIBLE CAR

COMPANY, BIG SOLAR COMPANY.

YOU KNOW, HE TENDS TO KNOW WHAT HE'S TALKING ABOUT.

BUT I DON'T KNOW THE SCIENCE BEHIND NUKING THE PLANET.

>> ANOTHER PERSON IN THE AUDIENCE HERE WRITES U.S./RUSSIA

RELATIONS ARE TENSE ON EARTH BUT SEEM VERY PRODUCTIVE IN SPACE.

WHAT CAN LEADERS ON EARTH LEARN FROM YOUR COOPERATION ABOARD THE INTERNATIONAL SPACE STATION?

IT WAS RELATIONSHIPS IN SPACE AND ON EARTH, TRAINING OR

PREPARING TO LAUNCH INTO SPACE ARE GREAT.

OUR COLLEAGUES THERE ARE VERY CAPABLE.
THEY ARE VERY FRIENDLY.

I HAD A GREAT TIME IN SPACE WITH ANTON AND SASHA AND MISHA WHO IS UP THERE WITH SCOTT.

WE HAD A GREAT EXPERIENCE WITH THEM.

I THINK THE STATION HAS ACCOMPLISHED A LOT OF THINGS AND

THE MOST IMPORTANT THING IS THE INTERNATIONAL RELATION ASPECT OF IT.

OF ALL THE UPS AND DOWNS OF RELATIONSHIPS ON EARTH THE SPACE STATION HAS BEEN A VERY POSITIVE BEACON OF LIGHT.

SO TERRY, YOU WERE ON THE SPACE STATION DURING EXPERIMENTS WITH 3-D PRINTING.

PLEASE EXPLAIN THIS FOR THE SPACE STATION NOW AND IN THE
FUTURE.

WERE THERE ANY PARTS PRODUCED DURING THE TEST RUN THAT WERE

USED AND ANY LESSONS LEARNED THAT CAN IMPROVE THE TECHNOLOGY

IN THE NEAR TERM.

>> I'LL LET SAMANTHA ANSWER.

THE 3-D PRINT CIGARETTE A GREAT CONCEPT IN THAT YOU CAN IMAGINE

GOING TO MARS, YOUR CLOSET IS FULL AND YOU'RE LIMITED TO ONE

BAG ONLY.

SO YOU CAN'T BRING ALL THE TOOLS YOU NEED.

IF YOU COULD POTENTIALLY PRINT OUT PARTS OR TOOLS, FOR EXAMPLE,

THAT COULD REALLY SAVE ON THE AMOUNT OF MASS YOU HAVE TO

LAUNCH.

WE DID MAKE A LITTLE WRENCH AND
IT WAS MADE OUT OF PLASTIC.

00:44:19,019 --> 00:44:21,429
IT WASN'T LIKE A HARD METAL WRENCH.

00:44:21,429 --> 00:44:23,919
IT WAS THE FIRST TIME IT'S EVER BEEN DONE IN SPACE.

00:44:23,920 --> 00:44:26,820
MORE OF A TECHNOLOGY DEMONSTRATOR.

00:44:26,820 --> 00:44:30,650
IT WAS PRETTY COOL TO SEE A TOOL PRINT MD OUT IN SPACE AND WE

00:44:30,650 --> 00:44:32,280
SENT IT BACK TO EARTH FOR ANALYSIS.

00:44:32,280 --> 00:44:34,320
WE DIDN'T KEEP IT.

00:44:34,320 --> 00:44:37,800
THAT'S A TECHNOLOGY THAT HAS A LOT OF PROMISE I THINK.

00:44:37,800 --> 00:44:41,289
>> MARK, WHAT'S THE LASTING IMPRESSION THAT SPACE HAS GIVEN

00:44:41,289 --> 00:44:44,239
YOU WHEN YOU THINK OF YOUR TIME UP THERE.

00:44:44,239 --> 00:44:48,459
WHAT'S THE THING THAT STRIKES YOU THE MOST LATER ON?

00:44:48,460 --> 00:44:54,690
>> WELL, I THINK, YOU KNOW, WHAT BECAME VERY OBVIOUS TO ME IN
2001 DURING MY FIRST SPACE MISSION WAS THAT WE LIVE ON AN
ISLAND, REALY UNFORGIVING ENVIRONMENT.

YOU KNOW YOU LOOK BACK AT THE EARTH FROM A DISTANCE AND YOU
HAVE VERY FEW PEOPLE ON BOARD THE SPACE SHUTTLE AND SPACE
STATION.

WE GOT 7.5 BILLION PEOPLE ON THIS ROUND BALL JUST FLOATING THERE IN THE BLACKNESS OF SPACE.

WE REALLY HAVE NO PLACE ELSE TO GO.

THAT BECOMES A VERY -- THAT WAS PRETTY STRIKING AND PRETTY
QUICK.

YOU KNOW, OBSERVATION ON MY PART AND I IMAGINE BY OTHER
ASTRONAUTS THAT FLY IN SPACE.
IT GIVES YOU A LITTLE BIT MORE
OF AN APPRECIATION FOR OUR

809
00:45:36,730 --> 00:45:41,329
PLANET AND WHAT IT DOES FOR ALL
OF US AND THE NEED FOR US TO

810
00:45:41,329 --> 00:45:42,699
CONSIDER THAT.

811
00:45:42,699 --> 00:45:45,309
AND TAKE CARE OF IT.

812
00:45:45,309 --> 00:45:46,400
>> RIGHT.

813
00:45:46,400 --> 00:45:50,160
TERRY, AS WE'VE TALKED ABOUT,
THE SPACE STATION CREW HAS

814
00:45:50,159 --> 00:45:54,029
CONDUCTED HUNDREDS OF
EXPERIMENTS, INCLUDING MANY THAT

815
00:45:54,030 --> 00:45:57,800
HAVE BEEN DEVELOPED BY SCIENCE
STUDENTS AND TRANSMITTED UP

816
00:45:57,800 --> 00:45:58,800
THERE.

817
00:45:58,800 --> 00:46:02,539
DO YOU CONSULT WITH THESE SAME
STUDENTS WHEN QUESTIONS ARISE

818
00:46:02,539 --> 00:46:04,590
AND IF SO HOW?

819
00:46:04,590 --> 00:46:07,710
AND WHICH SCIENCE STUDENT
EXPERIMENTS WERE THE MOST

820
00:46:07,710 --> 00:46:11,530
INTERESTING OR CHALLENGING?
>> WE DO HAVE -- IT DEPENDS ON THE EXPERIMENTS.

SOMETIMES THEY WILL -- WE JUST TALKED TO HOUSTON OR HUNTSVILLE AS THE NASA CONTROL CENTER WHEN WE DO EXPERIMENTS.

SOMETIMES IF IT'S COMPLICATED THEY TIE US INTO THE SCIENTISTS THAT MADE IT UP.

IT DEPENDS ON THE EXPERIMENT.

AND I'M TRYING TO THINK OF WHAT STUDENT ONLY EXPERIMENTS WE HAD.

MOST OF THE EXPERIMENTS WE DID YOU KIND OF DON'T -- YOU JUST DO THE EXPERIMENT AND DON'T REALLY KNOW WHO CAME UP WITH IT.

BUT AS FAR AS STUDENT EXPERIMENTS, THE STUDENT THINGS I DO REMEMBER IS THEY BUILT SOME EQUIPMENT LIKE SOME STORAGE BAGS OR STORAGE LOCATION AND STUFF.
SO I WAS NOT INVOLVED IN THIS BUT THERE'S A THING CALLED SEARS, LITTLE SATELLITES OF AIR JET AND THAT WAS A STUDENT LED EXPERIMENT WITH M.I.T.

MY CREW MATES WERE TALKING ON THE GROUND.VERY INTERACTIVE.

LIKE THESE ROBOTIC COMPETITION THAT KIDS DO ALTHOUGH SATELLITE SPACE COMPETITION THEY WERE FLYING AROUND.>> MARK, I MENTIONED EARLIER RELYING ON OTHERS FOR TRANSPORT UP TO THE SPACE STATION.

DO YOU THINK ENDING THE SPACE SHUTTLE PROGRAM BEFORE THERE WAS A REPLACEMENT SLOWED THE U.S. SPACE PROGRAM?
IN OTHER WORDS, WAS IT A GOOD TRANSITION OR COULD WE HAVE DONE BETTER?

>> SO, WE HAD THE COLUMBIA ACCIDENT HAPPEN IN 2003.

AND AFTER COLUMBIA THERE WAS A JOINT DECISION MADE TO RETIRE THE SPACE SHUTTLE BECAUSE WE REALIZED THAT IF WE CONTINUE TO FLY IT, YOU KNOW, OVER ANOTHER DECADE WE PROBABLY WOULD loose ANOTHER SPACECRAFT AND A CREW.

WE DIDN'T WANT TO DO THAT.

SO THIS IS A DECISION MADE BY THE WHITE HOUSE, BY CONGRESS AND BY NASA INCLUDING THE ASTRONAUT OFFICE.

THIS WAS THE RIGHT THING TO DO.

TO RETIRE THE SPACE SHUTTLE.

WHAT IT ALLOWED US TO DO IS
SPEED UP THE DEVELOPMENT OF WHAT

00:48:16,619 --> 00:48:20,759 THE NEXT SPACECRAFT WOULD BE.

00:48:20,760 --> 00:48:25,190 WHEN YOU GET INTO TESTING AND DEVELOPING AND BUILDING THE

00:48:25,190 --> 00:48:29,960 HARDWARE FOR A NEW SYSTEM, A NEW LAUNCH SYSTEM, A NEW ROCKET, A

00:48:29,960 --> 00:48:33,260 NEW SPACECRAFT IT GETS REALLY EXPENSIVE REALLY QUICKLY LIKE

00:48:33,260 --> 00:48:37,600 UPWARDS OF $2 TO $3 BILLION A YEAR TO DO THIS.

00:48:37,599 --> 00:48:41,599 HAPPENS THE SPACE SHUTTLE OPERATING BUDGET WAS $2 TO $3 BILLION A YEAR.

00:48:41,599 --> 00:48:48,559 TWO THINGS WE COULD HAVE DONE.

00:48:45,329 --> 00:48:48,559 WE COULD HAVE RETIRED THE SPACE SHUTTLE AND USE THAT MONEY TO

00:48:48,559 --> 00:48:55,320 DEVELOP A NEW SPACECRAFT OR WE COULD HAVE GOTTEN $2 TO $3 BILLION MORE OUT OF CONGRESS AND THE WHITE HOUSE TO DEVELOP A NEW

00:48:59,090 --> 00:49:00,760 SPACECRAFT AT THE SAME TIME.
NASA'S BUDGET IS ONLY ABOUT $19 BILLION.

SO YOU'RE TALKING ABOUT A 15% INCREASE IN NASA'S BUDGET TO BUILD A NEW SPACECRAFT.

IN THIS FISCAL ENVIRONMENT OVER THE LAST DECADE, I MEAN HOW HARD

DO YOU THINK IT WOULD BE FOR AN AGENCY TO GET AN INCREASE OF 15%

IN ITS YEARLY BUDGET.

IT WOULD BE REALLY, REALLY HARD TO DO.

SO, YOU KNOW, I ABSOLUTELY BELIEVE WE MADE THE RIGHT DECISION.

WE WANTED -- NOW I WOULD HAVE PERSONALLY WOULD HAVE REFUNDED THE SPACE SHUTTLE FOR THE REST OF MY LIFE IF I COULD.

I LOVED IT.
PART OF ME STILL WISHES IT WAS STILL AROUND.

BUT AT THE SAME TIME WE DID MAKE THE RIGHT DECISION BECAUSE THE SPACE SHUTTLE WAS DESIGNED -- THEY WERE EACH DESIGNED TO FLY ABOUT 100 FLIGHTS.

ENDEAVOR WHICH I FLEW ON ITS LAST FLIGHT THAT WAS FLIGHT NUMBER 25.

SO THEY WERE DESIGNED TO FLY 100 FLIGHTS BUT NOT DESIGNED TO FLY FOR 30 OR 40 YEARS AND THAT'S TISSUE WE WERE DEALING WITH.

SO, IT PUT US IN A POSITION WHERE WE HAVE TO RELY ON OUR RUSSIAN PARTNERS TO GET CREW MEMBERS TO AND FROM THE SPACE STATION RIGHT NOW AND NEXT COUPLE OF YEARS.

WE'LL BE BACK FLYING U.S. CREW MEMBERS ON U.S. ROBERTS FROM
U.S. SOIL HERE IN NO TIME AND I THINK IT PUTS US ON A GOOD PATH GOING FORWARD.

DO EITHER ONE OF YOU, IF YOU WERE IN CONGRESS OR THE PRESIDENT WHERE WOULD YOU FOCUS OUR RESOURCES FOR NASA?

WOULD IT BE MARS MISSION, MISSIONS LIKE PLUTO FLY BY GOING BACK TO THE MOON?

THE SPACE STATION?

WHERE DO WE NEED TO PUT OUR FOCUS?

WE WOULD DO EVERYTHING.

DO IT ALL?

IF IT WAS UP TO ME.

WHAT IF YOU DIDN'T HAVE UNLIMITED RESOURCES WHAT WOULD
YOU PRIORITIZE.

907
00:50:53,940 --> 00:50:55,000
>> THAT'S HARDER.

908
00:50:55,000 --> 00:50:59,909
I'LL LET TERRY ANSWER THAT.

909
00:50:59,909 --> 00:51:00,909
>> NO.

910
00:51:00,909 --> 00:51:04,940
I THINK NASA DOES NOT HAVE JUST
ONE -- I WOULD NOT FOCUS JUST ON

911
00:51:04,940 --> 00:51:05,940
ONE THING.

912
00:51:05,940 --> 00:51:10,510
NASA HAS A BROAD MISSION TO DO
BOTH AIRCRAFT RESEARCH AND

913
00:51:10,510 --> 00:51:13,320
ROBOTIC SPACE EXPLORATION AND
HUMAN SPACE EXPLORATION.

914
00:51:13,320 --> 00:51:16,130
SO I WOULD DIVIDE IT UP.

915
00:51:16,130 --> 00:51:19,809
>> TERRY YOU STAY CONNECTED TO
EARTH THROUGH YOUR FAVORITE

916
00:51:19,809 --> 00:51:21,920
PASTIME OF BASEBALL WHEN YOU
WERE UP THERE.

917
00:51:21,920 --> 00:51:25,849
AS I UNDERSTAND YOU SET OUT TO
PHOTOGRAPH EVERY MAJOR LEAGUE

918
00:51:25,849 --> 00:51:30,159
BALLPARK FROM ORBIT AND YOU
POSTED MANY OF THESE IMAGES ON
SOCIAL MEDIA.

DID YOU GET THEM ALL?

WHERE DID THAT END UP?

>> I GOT ALMOST ALL. AND THE COAST STADIUMS ARE PRETTY EASY TO GET.

LIKE BALTIMORE IS EASY TO GET.

D.C. IS EASY TO GET.

NEW YORK STADIUMS.

BOSTON IS VERY EASY.

SAN DIEGO.

WHEN YOU GET TO THE MIDDLE OF THE COUNTRY IT GETS TOUGH BECAUSE THERE'S NO -- THERE'S NOTHING OBVIOUS AROUND KANSAS CITY, HUNDREDS OF MILES OF FLAT OR ST.
LOUIS OR CINCINNATI.

SO THE ONES ON THE CORNERS WERE VERY EASY TO GET AND THE ONES IN THE MIDDLE WERE TOUGHER TO GET.

I THINK I GOT THEM ALL.

I STILL NEED TO GO THROUGH FILES AND DOUBLE CHECK THE ONES IN THE CENTER OF THE COUNTRY.

PITTSBURGH WAS DIFFICULT TO GET WITH THOSE HILLS IN WESTERN PENNSYLVANIA.

MY BROTHER IS WORKING ON TRYING TO GET ALL THE FOOTBALL STADIUMS NOW BECAUSE OF WHAT DID YOU.

MAYBE THAT'S WHERE HE GOT THAT IDEA.

BEFORE I ASK THE FINAL QUESTION I HAVE SOME HOUSE KEEPING.
I WANT TO REMIND PEOPLE IN THE ROOM THAT OUR ASTRONAUTS WILL BE AVAILABLE DOWN THE HALL FOR STAND UP INTERVIEWS IMMEDIATELY AFTER THIS PROGRAM CONCLUDES.

I ALSO WANT TO REMIND YOU THAT THE NATIONAL PRESS CLUB IS THE WORLD'S LEADING PROFESSIONAL ORGANIZATION FOR JOURNALISTS.

WE FIGHT FOR A FREE PRESS WORLDWIDE AND FOR MORE INFORMATION ABOUT THE CLUB VISIT OUR WEBSITE PRESS.ORG AND TO DONATE TO OUR NONPROFIT JOURNALISM INSTITUTE VISIT PRESS.ORG/INSTITUTE.

I WOULD ALSO LIKE TO REMIND YOU ABOUT SOME UPCOMING PROGRAMS.

THIS WEDNESDAY SEPTEMBER 16th AT 1:30 P.M.

ARCHBISHOP THOMAS
WISKY OF MIAMI, BISHOP OSCAR OF

957
00:53:13,130 --> 00:53:14,710
MEXICO AND DR.

958
00:53:14,710 --> 00:53:20,880
CAROLINE WU WILL
DISCUSS POPE FRANCIS' UPCOMING

959
00:53:20,880 --> 00:53:26,079
VISIT TO WASHINGTON, D.C.
ON MONDAY SEPTEMBER 21st, BIG 12

960
00:53:26,079 --> 00:53:30,460
COMMISSIONER WILL DISCUSS
COLLEGE ATHLETICS AND JANE CHU

961
00:53:30,460 --> 00:53:33,730
CHAIR OF THE NATIONAL ENDOWMENT
FOR THE ARTS WILL DISCUSS NEW

962
00:53:33,730 --> 00:53:36,740
INITIATIVES ON SEPTEMBER
28th.

963
00:53:36,739 --> 00:53:44,819
I WANT TO PRESENT OUR GUESTS
WITH A PRESS CLUB MUG, MUCH

964
00:53:44,820 --> 00:53:46,050
cherished.

965
00:53:46,050 --> 00:53:49,140
YOU CAN'T EASILY FIND IT ON THE
SPACE STATION EITHER.

966
00:53:49,139 --> 00:53:50,269
VERY VALUABLE.

967
00:53:50,269 --> 00:53:54,000
WE'LL HAVE TO FIGURE OUT A WAY
TO GET TO IT YOUR BROTHER RIGHT?

968
00:53:54,000 --> 00:53:56,880
>> I CAN TAKE CARE OF THAT.
NOT VERY USEFUL IN SPACE, THOUGH.

[ LAUGHTER ]

WE MENTIONED, YOU KNOW, THE MARS MOVIE THAT WILL BE COMING OUT.

SO MUCH FASCINATION IN LITERATURE, MOVIES, TELEVISION WITH SPACE.

I MYSELF, OF COURSE, "STAR TREK" JUNKY, GREW UP THAT WAY.

HOW ABOUT YOU GUYS?

COULD EACH OF YOU TELL ME WHAT KIND OF SCIENCE FICTION YOU ENJOY IF ANY AND WHAT YOU THINK ABOUT THE MOVIES AND THE SCIENCE FICTION THAT YOU SEE OUT THERE EITHER IN BOOKS OR ON TV OR IN THE MOVIES STARTING WITH YOU TERRY.

I ALWAYS ENJOYED IT AS A KID.
"STAR WARS" WAS THE BIG THING.

I LOVED THAT.

I REMEMBER READING ARTHUR CLARK AS A TEENAGER.

HE WROTE SOME GREAT STUFF.

WATCHING "2001."

I WATCHED THAT WHEN I WAS IN SPACE AND I THOUGHT A LOT OF THE STUFF CAME TRUE 50 YEARS LATER.

JUST WATCHED IT WHILE I WAS IN SPACE.

A LOT OF THAT STUFF IS NOT WHAT'S GOING ON THE SPACE STATION.

>> DID HE IN GET IT WRONG MOST OF THE TIME?

>> HOLLYWOOD HAS TO MAKE IT EXCITING.

SCOTT BROUGHT UP THIS PROJECTOR.

WE WATCHED "GRAVITY."

WE WATCHED THE DISASTER MOVIE "GRAVITY."

IT WAS FUN.

THE MECHANICS OF WHERE EVERYTHING WAS AND WHAT IT LOOKED LIKE WAS VERY REAL.

THEY GOT THAT DONE.

OF COURSER WITH DON'T HAVE GIANT EXPLOSIONS AND FIRE BALLS AND THEY HAVE TO MAKE THAT TO MAKE THE MOVIE INTERESTING.

BUT IF WAS JUST ASTRONAUTS DOING SCIENCE EXPERIMENTS IT WOULDN'T GROSS VERY MUCH AT THE BOX OFFICE.

[ LAUGHTER ]

MARK, HOW ABOUT YOU

I STARTED READING THIS BOOK CALLED "7 ES" ABOUT USING THE
SPACE STATION TO SAVE HUMANITY
AFTER SOMETHING BAD HAPPENS ON
EARTH.

PRETTY INTERESTING TO SEE HOW,
YOU KNOW, EITHER AN AUTHOR OR
HOLLYWOOD USES EXISTING SPACE
TECHNOLOGY IN THEIR MOVIES AND
AS, WHEN I WAS YOUNGER, LIKE
THESE GUYS AGE DOWN HERE,
BROTHERS AND SISTERS DOWN HERE I
USED TO READ A LOT OF ROBERT
HEIDLUM AND THOSE KIND OF BOOKS.
MADE ME THINK WHAT IT WOULD BE
LIKE TO BE IN SPACE ONE DAY AND
I THINK THAT'S IMPORTANT.
GIVES PEOPLE, YOU KNOW, AMBITION
AND THEY CAN PICTURE THEMSELVES
IN A DIFFERENT PLACE AND A
DIFFERENT TIME.

THE GOOD THING, MARK W-ALL
THE GENETIC DATA THEY HAVE ON
YOU AND YOUR BROTHER IF APOCALYPSE COMES WE CAN CLONE

YOU GUYS, MILLIONS OF KELLY BROTHERS.

WHAT ABOUT YOUNG PEOPLE, I MENTIONED AS A YOUNGSTER AND YOU

AS A YOUNGSTER WE WERE SO FASCINATED WITH THE SPACE

YOUNG PEOPLE WHO WANT TO GO TO SPACE SOME DAY, GET ON THAT

CAREER TRACK, WHAT WOULD YOU TWO SUGGEST THAT THEY DO?

I KNOW WE GET ASKED THIS QUESTION ALL THE TIME.

WHAT DO I NEED TO DO TO BE AN ASTRONAUT.

DO WHAT YOU'RE PASSIONATE ABOUT.

EVERYBODY HAS BEEN BLESSED WITH DIFFERENT ABILITIES AND SKILLS.
WHAT YOU ARE CREATED TO DO, GO DO THAT DEAN IT WELL.

1030 00:57:32,789 --> 00:57:34,730 THERE'S NOT ONE PATH TO BEING AN ASTRONAUT.

1031 00:57:34,730 --> 00:57:37,159 THERE'S A LOT OF DIFFERENT ENGINEERS AND SCIENTISTS AND

1032 00:57:37,159 --> 00:57:41,940 MARK AND IN ARE PREVIOUS PILOTS IN OUR FORMER LIVES.

1033 00:57:41,940 --> 00:57:46,030 THERE'S MEDICAL DOCTORS, SCOTT IS A MEDICAL DOCTOR.

1034 00:57:46,030 --> 00:57:54,480 THE KEY IS TO DO WHAT YOU'RE PASSIONATE ABOUT AND WHERE YOUR GIFTS ARE.

1035 00:57:54,480 --> 00:57:55,480

1036 00:57:55,480 --> 00:57:58,469 >> WE'RE ALSO ON THE CUSP OF THIS BIG SEA CHANGE WITH ACCESS

1037 00:57:58,469 --> 00:58:00,169 TO SPACE FOR PEOPLE.

1038 00:58:00,170 --> 00:58:04,599 THERE'S A VERY HIGH PROBABILITY THAT, YOU KNOW, THE YOUNG PEOPLE

1039 00:58:04,599 --> 00:58:07,819 IN HERE TODAY, SOMETIME IN THEIR LIVES EVEN IF THEY ARE NOT A

1040 00:58:07,820 --> 00:58:10,970 PROFESSIONAL ASTRONAUT WILL HAVE THE OPPORTUNITY TO GO INTO

1041
YOU KNOW YOU SEE COMPANIES LIKE VIRGIN GALACTIC AND OTHERS THAT ARE STARTING ON THIS ROAD TO SPACE TOURISM.

AND IT'S EXCITING, AND WE'RE GOING TO SEE A LOT MORE -- RIGHT NOW THERE'S PROBABLY ABOUT 550 PEOPLE THAT HAVE EVER BEEN IN SPACE AND I THINK THAT NUMBER IS GOING TO GROW SUBSTANTIALLY.

PEOPLE ARE STARTING TO THINK THIS CAN DIRECTLY AFFECT THEM. MAYBE THEY WILL BE THE PERSON IN SPACE.

I THINK THAT'S TRUE.

MAYBE IN SOME OF OUR LIFE TIMES INSTEAD OF TAKING A FLIGHT FROM, YOU KNOW, NEW YORK TO LONDON, THAT TYPICALLY TAKES SIX, SEVEN HOURS MAYBE SOME OF US SOME DAY WILL BE TAKING THAT FLIGHT IN
HOW FAST WE CAN DO IT IN THE SPACE SHUTTLE WHICH IS ABOUT 40 MINUTES.

YOU KNOW THAT IS -- THERE'S NO REASON WHY THAT IS NOT POSSIBLE IN THE NEXT, IN THE COMING DECADE.

I THINK PEOPLE ARE STARTING TO THINK ABOUT THIS DIFFERENTLY.

>> HOW ABOUT AROUND MUCH APPLAUSE FOR OUR GUESTS?

[ APPLAUSE ]

>> I WANT TO THANK OUR NATIONAL PRESS CLUB STAFF FOR THEIR WORK ON TODAY'S PROGRAM.

IF YOU WANT A COPY OF THIS PROGRAM GO TO OUR WEBSITE PRESS.ORG AND THAT'S WHERE YOU CAN LEARN MORE ABOUT THE NATIONAL PRESS CLUB.

THANK YOU SO MUCH FOR ATTENDING TODAY.
WE ARE ADJOURNED.