



Space**to**Ground

1
00:00:03,016 --> 00:00:04,966
WELCOME TO SPACE TO
GROUND, I'M GARY JORDAN.

2
00:00:05,266 --> 00:00:07,716
THIS WEEK, TWO COSMONAUTS
VENTURED OUTSIDE THE SPACE

3
00:00:07,716 --> 00:00:08,936
STATION FOR A SPACEWALK.

4
00:00:10,726 --> 00:00:13,476
EXPEDITION 59 COMMANDER
OLEG KONENENKO

5
00:00:13,476 --> 00:00:16,246
AND FLIGHT ENGINEER ALEXEY
OVCHININ CONDUCTED THE FOURTH

6
00:00:16,326 --> 00:00:18,166
SPACEWALK OF 2019.

7
00:00:18,166 --> 00:00:19,546
AFTER HEADING OUT THE HATCH

8
00:00:19,546 --> 00:00:21,286
OF THE PIRS DOCKING
COMPARTMENT AIRLOCK,

9
00:00:21,626 --> 00:00:24,456
THE DUO SET OUT TO INSTALL
HANDRAILS ON THE RUSSIAN SEGMENT

10
00:00:24,456 --> 00:00:26,976
OF THE COMPLEX, RETRIEVE
SOME SCIENCE EXPERIMENTS,

11
00:00:27,196 --> 00:00:28,366
AND CONDUCT MAINTENANCE WORK.

12
00:00:28,536 --> 00:00:31,606
THE TWO COSMONAUTS PAYED
TRIBUTE TO ALEXEY LEONOV

13
00:00:31,806 --> 00:00:34,306
FOR HIS 85TH BIRTHDAY
WITH PLACARDS ADDED

14
00:00:34,306 --> 00:00:36,636
TO THEIR ORLAN SPACESUITS
FOR THE EXCURSION.

15
00:00:36,876 --> 00:00:40,406
LEONOV WAS THE FIRST HUMAN TO
CONDUCT A SPACEWALK ON MARCH 18,

16
00:00:40,406 --> 00:00:43,136
1965 DURING THE VOSKHOD
2 MISSION,

17
00:00:43,266 --> 00:00:46,426
WHEN HE EXITED THE
SPACECRAFT FOR 12 MINUTES.

18
00:00:46,466 --> 00:00:47,886
IMPORTANT SCIENCE
BEING CONDUCTED

19
00:00:47,886 --> 00:00:50,806
IN MICROGRAVITY IS GETTING
READY TO COME BACK TO 1G.

20
00:00:52,536 --> 00:00:55,316
STATION ASTRONAUTS WILL HAVE
MUCH OF THIS SUNDAY DEDICATED

21
00:00:55,316 --> 00:00:57,796
TO LOADING UP THE SPACEX
DRAGON WITH SCIENCE

22

00:00:57,896 --> 00:00:59,396

FOR ITS RETURN HOME
ON JUNE THIRD.

23

00:00:59,996 --> 00:01:03,156

AMONG THE MORE THAN 4,200
POUNDS OF CARGO RETURNING

24

00:01:03,156 --> 00:01:05,856

TO EARTH INCLUDES EXPERIMENTS
IN PROTEIN CRYSTAL GROWTH,

25

00:01:06,136 --> 00:01:08,746

RODENT RESEARCH,
MICROALGAE, AND DNA STUDIES.

26

00:01:09,626 --> 00:01:12,226

TUNE INTO LIVE COVERAGE OF
DRAGON'S DEPARTURE FROM STATION

27

00:01:12,356 --> 00:01:14,676

ON NASA TV OR THE
AGENCY'S WEBSITE.

28

00:01:14,816 --> 00:01:18,536

THERE'S A LOT OF SCIENCE TO CRAM
INTO THE DRAGON FOR RETURN HOME,

29

00:01:18,926 --> 00:01:20,746

SOME OF WHICH REPLICATES
THE STRUCTURE

30

00:01:20,746 --> 00:01:21,976

AND FUNCTION OF HUMAN ORGANS.

31

00:01:22,026 --> 00:01:24,096

BUT WHEN THEY'RE THE
SIZE OF A THUMB DRIVE,

32

00:01:24,186 --> 00:01:26,016

IT MAKES IT A BIT EASIER TO FIT.

33

00:01:28,186 --> 00:01:31,176

TISSUE CHIPS ARE TINY DEVICES
THAT CONTAIN HUMAN CELLS

34

00:01:31,176 --> 00:01:34,506

IN A 3D MATRIX THAT HELP
SCIENTISTS STUDY HOW THOSE CELLS

35

00:01:34,506 --> 00:01:37,096

RESPOND TO STRESSES,
DRUGS, GENETIC CHANGES,

36

00:01:37,286 --> 00:01:38,546

AND NOW, MICROGRAVITY.

37

00:01:39,176 --> 00:01:42,026

CHIPS SPECIALIZED TO LOOK AT
AREAS LIKE LUNG HOST DEFENSE,

38

00:01:42,306 --> 00:01:44,946

THE BLOOD-BRAIN BARRIER,
MUSCULOSKELETAL DISEASE

39

00:01:44,946 --> 00:01:47,576

AND KIDNEY FUNCTION CAN
BE TESTED USING FACILITIES

40

00:01:47,576 --> 00:01:50,006

ON THE INTERNATIONAL SPACE
STATION TO SEE WHAT HAPPENS

41

00:01:50,006 --> 00:01:52,436

TO THESE ORGANS IF YOU TAKE
AWAY GRAVITY FROM THE EQUATION.

42

00:01:52,486 --> 00:01:55,816

TISSUE CHIPS WILL BE RETURNING
ON THE SPACEX DRAGON TO EARTH

43
00:01:55,896 --> 00:01:58,806
SO SCIENTISTS CAN CONTINUE
STUDYING THESE FUNCTIONS AND SEE

44
00:01:58,806 --> 00:02:00,996
IF THERE'S AN EFFECT
WHEN SWITCHING BACK TO 1G

45
00:02:01,356 --> 00:02:02,766
AND WHETHER THE CHANGES
ARE REVERSED

46
00:02:02,766 --> 00:02:04,360
FROM WHAT THEY'VE
SEEN IN MICROGRAVITY.