



**Space**to**Ground**

1  
00:00:02,706 --> 00:00:04,656  
"HOUSTON, STATION  
ON SPACE TO GROUND."

2  
00:00:05,286 --> 00:00:07,436  
WELCOME TO SPACE TO  
GROUND, I'M ISIDRO REYNA.

3  
00:00:07,716 --> 00:00:10,446  
THE SCIENCE CONTINUES ABOARD  
THE INTERNATIONAL SPACE STATION.

4  
00:00:11,526 --> 00:00:14,236  
THIS WEEK, THE CREW MADE  
PREPARATIONS FOR THE ARRIVAL

5  
00:00:14,236 --> 00:00:17,526  
OF ASTROBEE, A SELF-CONTAINED,  
FREE FLYING ROBOT

6  
00:00:17,696 --> 00:00:20,786  
THAT WILL BE FLYING AROUND THE  
STATION ALONGSIDE ASTRONAUTS

7  
00:00:20,786 --> 00:00:21,586  
LATER THIS YEAR.

8  
00:00:22,106 --> 00:00:24,776  
ASTROBEE WILL HELP SCIENTISTS  
AND ENGINEERS DEVELOP

9  
00:00:24,916 --> 00:00:27,236  
AND TEST TECHNOLOGIES  
FOR USE IN ZERO-GRAVITY;

10  
00:00:27,636 --> 00:00:29,906  
HELP THE ASTRONAUTS DO  
THEIR ROUTINE CHORES;

11

00:00:30,206 --> 00:00:32,666  
AND GIVE FLIGHT CONTROLLERS  
IN HOUSTON ADDITIONAL EYES

12  
00:00:32,666 --> 00:00:33,786  
AND EARS ON THE STATION.

13  
00:00:33,786 --> 00:00:36,446  
THE AUTONOMOUS ROBOT,  
POWERED BY FANS

14  
00:00:36,446 --> 00:00:39,666  
AND VISION-BASED NAVIGATION,  
WILL PERFORM CREW MONITORING,

15  
00:00:39,856 --> 00:00:42,496  
SAMPLING, LOGISTICS  
MANAGEMENT, AND ACCOMMODATE

16  
00:00:42,496 --> 00:00:43,896  
UP TO THREE INVESTIGATIONS.

17  
00:00:44,456 --> 00:00:46,616  
ASTROBEE BUILDS ON THE  
SUCCESS OF SPHERES,

18  
00:00:46,906 --> 00:00:49,606  
NASA'S FIRST GENERATION  
FREE-FLYER NOW ABOARD

19  
00:00:49,646 --> 00:00:50,136  
THE STATION.

20  
00:00:51,306 --> 00:00:54,226  
LIFE IN MICROGRAVITY REPRODUCES  
MANY EFFECTS ENCOUNTERED

21  
00:00:54,226 --> 00:00:57,156  
ON EARTH BY PEOPLE  
DURING PROLONGED BED STAYS

22  
00:00:57,236 --> 00:01:00,866  
IN INTENSIVE CARE, PERSONS WITH  
REDUCED MOBILITY OR WITH AGING.

23  
00:01:01,786 --> 00:01:04,596  
A BETTER UNDERSTANDING OF THE  
RELATIONSHIP BETWEEN FAT CELLS

24  
00:01:04,786 --> 00:01:06,956  
AND BLOOD-PRODUCING CELLS  
IN THE BONE MARROW IS KEY

25  
00:01:07,156 --> 00:01:08,426  
TO MINIMIZE THE IMPACT

26  
00:01:08,426 --> 00:01:10,346  
OF DECREASED ACTIVITY  
IN OUR SOCIETY.

27  
00:01:11,076 --> 00:01:14,086  
ASTRONAUTS ON STATION WORKED  
ON THE MARROW INVESTIGATION,

28  
00:01:14,236 --> 00:01:16,856  
WHICH LOOKS AT THE EFFECT OF  
MICROGRAVITY ON THE BONE MARROW.

29  
00:01:17,116 --> 00:01:19,026  
IT IS BELIEVED THAT  
MICROGRAVITY,

30  
00:01:19,206 --> 00:01:22,456  
LIKE LONG-DURATION BED REST ON  
EARTH, HAS A NEGATIVE EFFECT

31  
00:01:22,456 --> 00:01:24,266  
ON THE BONE MARROW  
AND THE BLOOD CELLS

32

00:01:24,266 --> 00:01:25,706

THAT ARE PRODUCED  
IN THE BONE MARROW.

33

00:01:25,846 --> 00:01:29,346

THE EXTENT OF THIS EFFECT, AND  
ITS RECOVERY, ARE OF INTEREST

34

00:01:29,346 --> 00:01:31,806

TO SPACE RESEARCH AND  
HEALTHCARE PROVIDERS ON EARTH.

35

00:01:32,826 --> 00:01:34,676

THE WEEK'S QUESTION  
COMES FROM CAITLYN

36

00:01:34,676 --> 00:01:36,106

OF RJO INTERMEDIATE SCHOOL.

37

00:01:36,266 --> 00:01:38,006

SHE WANTS TO KNOW  
WHAT'S THE LONGEST AMOUNT

38

00:01:38,006 --> 00:01:40,746

OF TIME AN ASTRONAUT OR  
COSMONAUT HAS SPENT IN SPACE.

39

00:01:41,136 --> 00:01:42,516

WELL, THAT'S A GREAT  
QUESTION, CAITLYN.

40

00:01:42,876 --> 00:01:44,916

WE'LL HAVE TO TAKE A LOOK  
BACK INTO OUR ARCHIVES.

41

00:01:45,116 --> 00:01:49,416

THE RUSSIAN SPACE STATION MIR  
ENDURED 15 YEARS IN ORBIT,

42

00:01:49,716 --> 00:01:51,316  
THREE TIMES ITS PLANNED  
LIFETIME.

43  
00:01:51,716 --> 00:01:54,566  
IT HOSTED SCORES OF CREWMEMBERS  
INCLUDING PHYSICIAN VALERI

44  
00:01:54,566 --> 00:01:57,026  
POLYAKOV, WHO LIVED  
ABOARD MIR FOR A SINGLE,

45  
00:01:57,076 --> 00:02:00,296  
CONTINUOUS-ORBIT  
STAY OF 438 DAYS.

46  
00:02:00,906 --> 00:02:02,816  
HE COMPLETED HIS STAY IN 1995.

47  
00:02:03,606 --> 00:02:07,406  
IN COMPARISON, AND MOST  
RECENTLY, RETIRED NASA ASTRONAUT

48  
00:02:07,406 --> 00:02:09,926  
AND EXPEDITION 46  
COMMANDER SCOTT KELLY

49  
00:02:10,256 --> 00:02:14,486  
AND HIS RUSSIAN COUNTERPART  
MIKHAIL KORNIENKO SPENT 340-DAYS

50  
00:02:14,486 --> 00:02:15,946  
ABOARD THE INTERNATIONAL  
SPACE STATION.

51  
00:02:16,606 --> 00:02:18,496  
THEY COMPLETED THEIR  
MISSION IN 2016.

52  
00:02:20,006 --> 00:02:22,386

KEEP SENDING IN YOUR QUESTIONS  
USING THE HASHTAG SPACE